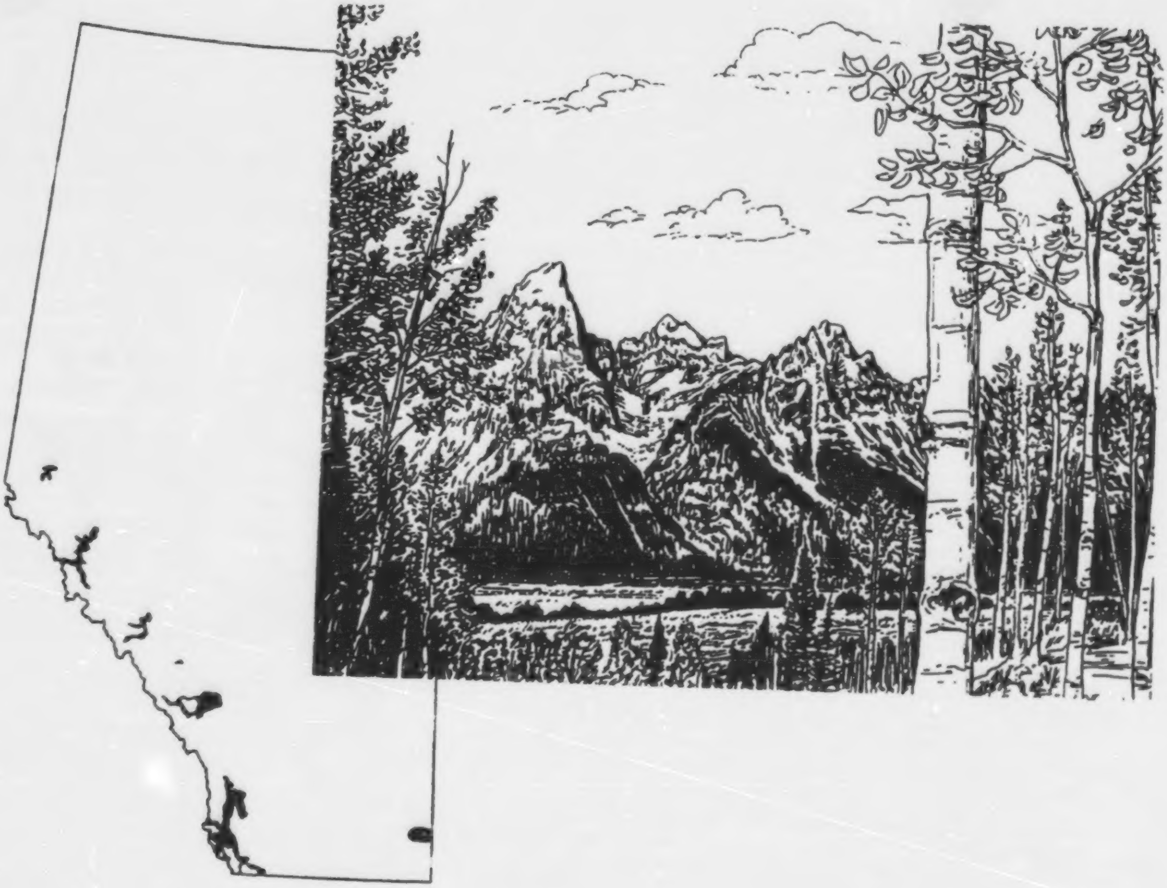
RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE MONTANE SUBREGION OF ALBERTA



Alberta
ENVIRONMENT

RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE MONTANE SUBREGION

Fourth approximation

(Please note this edition is a revision of the 2nd and 3rd approximations of the Range plant community types and carrying capacity for the Montane subregion. Pub. no. T/343 and T/433)

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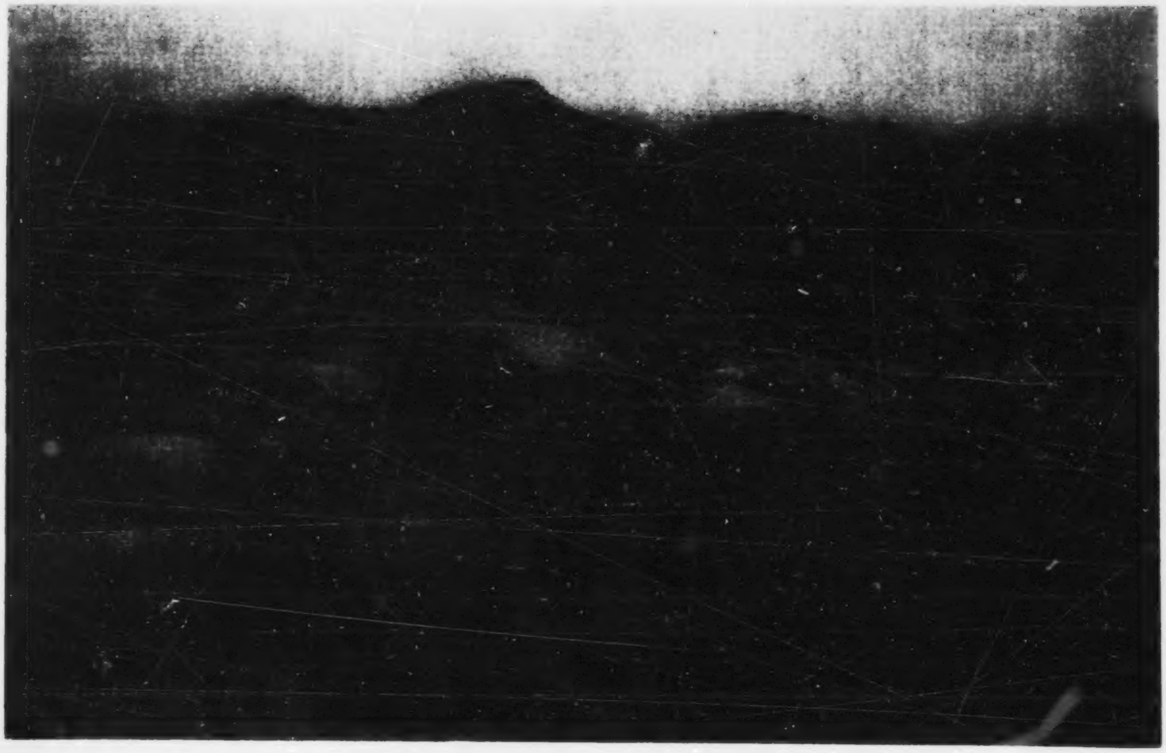

Photo 1. Rolling topography of the Montane subregion: This illustrates the grassland-shrubland and grassland-forest ecotones of the Montane subregion.

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Abstract

The Montane subregion is one of the most diverse subregions within the province of Alberta. The ecological diversity of this subregion creates a landscape that consists of a mosaic of different vegetative communities. This diversity means that these lands are valued for a multitude of uses, including summer range for livestock, prime habitat for many species of wildlife, productive watersheds, wood fibre production and recreation. Despite the importance of many of the vegetation types in the Montane for livestock grazing, there is little information available on how grazing influences the plant community. There is little information on forage productivity, carrying capacity and the associated community types that develop through succession or from disturbance including grazing. This lack of information makes it difficult to develop management prescriptions. As a result "Carrying capacity guides" are being developed for each natural and subregion in the province to provide a framework that would easily group the vegetative community types. It is hoped this classification system can be used by field staff to assess carrying capacity and evaluate range condition on lands within each region.

This guide represents the analysis of 1033 plots described in the Montane subregion This guide also includes plots done in the Montane subregion of Banff and Jasper National Parks and 8 new community types described in the Ya Ha Tinda area west of Sundre. The 1033 plots represent 115 community types. These types are split into:

A. Native grasslands (Banff and Jasper Mountain ecodistricts)	14 types
B. Native grasslands (Blairmore and Morley Foothills ecodistricts)	16 types
C. Disturbed grasslands (Blairmore and Morley Foothills ecodistricts)	11 types
D. Native shrublands	13 types
E. Conifer types	24 types
F. Mixedwood types	13 types
G. Deciduous types	16 types
H. Cutblocks	8 types

The dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and carrying capacity are outlined for each type.

Introduction

The province of Alberta is covered by a broad spectrum of vegetation regions from prairie in the South, to alpine vegetation in the mountains and dense forests in the Central and Northern part of the province. These broad vegetation regions have been classified into 20 subregions for the province (Strong and Thompson 1995). Each of the 20 subregions consists of groups of plant communities which are influenced by environmental conditions and human impacts. Intensive management of these regions requires the ability to recognize the vegetative communities that have similar productivities and respond to disturbance in the same way. The increase in use of Alberta's northern forests has recently stimulated efforts to develop detailed classification systems. Some of these classification systems include "Field guide to Forest ecosystems of West Central Alberta" (Corns and Annas 1986) and "Field Guide to Ecosites of Southwestern Alberta" (Archibald et al. 1996).

The vegetative communities in the province of Alberta are highly regarded by most resource managers for their ability to provide a wide variety of benefits. They are a classic example of multiple use land, providing summer range for livestock, prime habitat for many species of wildlife, wood fibre, productive watersheds and recreational areas. Despite the importance of these vegetation types for livestock grazing, there is little information available on how grazing affects their production. Specifically, there is little data on the levels of utilization which are detrimental to a plant communities health. There is also little information on forage productivity, carrying capacity and associated community types that occurs with grazing. Traditionally, these community types have been rated at 5 ac/AUM or 60 ac/head/year, but recent work has shown that productivity can vary significantly depending upon the ecological conditions of the site.

The purpose of this guide was to develop a framework that would easily group the vegetative community types in the Montane subregion of the province. The ultimate goal is a classification system that can be used by the field staff to assess carrying capacity and evaluate range condition on lands within the region.

Climate of Montane subregion

The Montane subregion composes only 0.9 percent of the province and is found in an area south of Chain Lakes to the Montana border, portions of the Bow and Athabasca river valleys and isolated areas near Ya Ha Tinda and Grande Cache (Map 1) (Strong and Leggat 1992). The Montane is distinguished from the other subregions by the presence of Douglas-fir (*Pseudotsuga menziesii*), limber pine (*Pinus flexilis*) and lodgepole pine (*Pinus contorta*). Elevationally the Montane occurs below the Subalpine in the mountains and above the Foothills Fescue grass and Aspen parkland subregions in southern Alberta.

Yearly precipitation ranges 308 mm to 1279 mm with two precipitation peaks occurring in May-June and again in August-September (Strong 1992). Summer monthly temperatures average 11.9°C and are 2°C warmer than the Subalpine and 2°C colder than the Foothills Fescue grass subregions. The Montane has the warmest winter temperatures of any forested region in Alberta because of chinook activity and reduced influence of Arctic air (Strong 1992).

Map 1. Location of Montane subregion in Alberta

Methods

A community type approach (Mueggler 1988) to classification was chosen in preference to the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because of the lack of understanding of the successional sequences of the communities. Community types are aggregates of similar plant communities based upon existing floristics regardless of successional status (Mueggler 1988). Community types are what is actually seen in the field. After defining the community types, they then can be linked to the ecosystem associations. In the mean time community types can be used as the basis for mapping and range management planning.

Initially, grazing dispositions were inventoried by forest region in order to develop management plans following the procedure outlined in the Rangeland Resource Information System (1991). Individual plots were initially classified within a forest region using cluster analysis (SAS) and ordination (DECORANA, Gauch 1982). These types were described in individual carrying capacity guides for each forest. This led to differences in classification of the same types between forests, particularly for deciduous forest types. In an effort to standardize the community name and gain some understanding of each community types ecology, all plots sampled in each forest were reclassified. As the study progressed it became quite evident that there were differences in the productivity of the communities between ecoregions. As a result, it was decided to develop the classification within the ecoregion framework (Strong and Leggat 1992). An ecoregion is a geographical area that has broad vegetation zones combined with climatic data (Strong and Anderson 1980). As a result, the vegetation within each ecoregion is strongly influenced by the climatic conditions. Recently, the department has adapted the Natural and Subregions of Alberta classification system. This system incorporates the Natural regions and subregions classification used by Parks with the Ecoregions of Alberta classification used by Forestry, Lands and Wildlife. The Montane subregion and ecoregion share the same boundary.

Sampling for this guide occurred within the Montane subregion . This guide outlines the classification of 1033 plots described in Banff and Jasper National Parks and Southeastern slopes forest region.

A plot consisted of a 10x10 m macroplot and ten randomly selected 1x1 m microplots to record the canopy cover of shrubs and ten nested 20x50 cm microplots to record the canopy cover of forbs and grass. The inventory followed the Range Survey Manual (1992) and uses the MF5 form. At each macroplot a 50x100 cm was clipped and separated into trees, shrubs, forbs and graminoids, oven dried and weighed. The recommended stocking rate is based on 25 percent of the total production for forested types and 50% total production for grass and shrubland types and the fact that one animal unit (1000 pd animal) requires 455 kg of dry weight material for one month of grazing.

How to use the guide

Decide what category the community type is in. If it is in the **Native grass or Shrub categories** it will not have tree cover and be found on steep south facing slopes or moist lowland areas adjacent to streams and rivers. The predominant species will be native grasses, willow and bog birch. The **Disturbed grassland** community types will resemble the native grassland community types, but will show signs of extensive grazing pressure. These community types will be dominated by grazing resistant species Kentucky bluegrass, clover and dandelion. A couple of moderately grazed community types with a predominant native species cover are also found in this category.

The **Deciduous category** will be plant communities dominated by deciduous tree species aspen and balsam poplar and the **Conifer category** will be plant communities dominated by subalpine fir, Engelmann or white spruce, lodgepole pine, limber pine, black spruce, larch or Douglas fir tree species. The **Mixedwood category** will contain communities that will have at least 50% of the total tree cover as conifer or deciduous. Finally the **Cutblock category** contains the types that have had timber harvesting.

In order to understand how the community types in this guide are related to the ecosites and ecosite phases outlined in "Ecosites of Southwestern Alberta" (Archibald et al. 1996), the community types in this guide are arranged by ecosite and ecosite phase (Table 1). **Ecosites** are defined as ecological units that develop under similar environmental influences (climate, moisture and nutrient regime). An **ecosite phase** is a subdivision of the ecosite based on the dominant species in the canopy. Table 1 is a reproduction of Figure 17 in the Ecosites of Southwestern Alberta guide with the community types in this guide highlighted in the range plant community type and grazing succession categories (Table 1). For the most part the ecosites and ecosite phases are the same, particularly for the forested community types, but a number of new ecosites and ecosite phases had to be created for the grass and shrubland community types (Table 1). The ecosites included (aa)(subxeric/medium) bluebunch wheatgrass, (cc)(submesic/rich) rough fescue grassland, (g) meadow (subhygric/very rich), (h) horsetail (hygric/rich) and (ij) fen (subhydric/rich). The (g) meadow, (h) horsetail, and (ij) fen ecosites are similar to the (e) meadow, (f) horsetail and (g) fen ecosites found in the guide Ecosites of West-Central Alberta (Beckingham et al. 1996). The ecosite phases include (aa1) bluebunch wheatgrass, (aa2) big sagebrush, (b4) yellow mtn. avens, (b5) bearberry grassland, (c5) grassland, (cc1) rough fescue grassland, (d4) white meadowsweet Aw, (d5) shrubland, (d6) grassland (e4) shrubland, (g1) shrubland, (g2) grassland, (h2) horsetail Sw, (h3) horsetail shrubland, (ij1) treed fen, (ij2) shrubby fen and (ij3) graminoid fen. The "Grazing succession" category (Table 1) outlines the successionl sequence the community type will undergo with increased grazing pressure. A number of grazed ecosite phases were included here. Thesed included: (aa1a) grazed grassland, (cc1a) grazed rough fescue, (d3a) cultivated Sw, (d4a) grazed Aw, (d5a) grazed shrubland, (e2a) grazed Aw, (f1a) grazed Pb, and (g1a) grazed shrubby meadow

Table 1. Ecosites, ecosite phases and plant community types for the Montane subregion (adapted from Archibald et al. 1996)(range plant community type and grazing succession communities are described in this guide, forested plant communities are outlined in guide to "Ecosites of Southwestern Alberta")

Ecosite	Ecosite Phase	Forested Plant Community Type	Range plant community type	Grazing succession
a limber pine/juniper (subxeric/poor)	a1 limber pine/juniper Fd-Pf	a1.1 Fd-Pf/juniper	E2 Pf-Fd/Juniper/Bearberry	
aa Bluebunch wheatgrass grassland (subxeric/medium)	aa1 grassland		B3 Bluebunch wheatgrass-Sedge A1 Fringed sage/Junegrass A2 Northern wheatgrass-Sheep fescue A3 Small leaved everlasting/Junegrass A4 Creeping juniper/N. wheatgrass-C. needlegrass A5 Little clubmoss/Richardson needlegrass	C6. Blunt sedge/Little clubmoss/Moss phlox C8 Northern wheatgrass-K. bluegrass A6. Kentucky bluegrass-Junegrass/Dandelion
	aa2 Big sagebrush		B5. Big sagebrush/B. wheatgrass-Sedge	
b bearberry (submesic/poor)	b1 bearberry Pl	b1.1 Pl/bearberry-juniper	E3 Pl/Bearberry-Juniper	
	b2 bearberry Aw	b2.1 Aw/bearberry	F1 Aw-Fd/Bearberry G1 Aw/Bearberry/Rough fescue	
	b3 bearberry Aw-Sw-Pl	b3.1 Aw-Sw-Pl/Bearberry	E4 Sw-Pl/Alder/Bearberry	

	b4 yellow mtn. avens		D1 Yellow Mtn. Avens-River alder/Low forb D2 Yellow Mtn. Avens/Junegrass F2 Sw-Pl-Pb/Yellow Mtn. avens	
	b5 bearberry grassland		A7. Bearberry-Juniper B6 Snowberry-Rose-Saskatoon/Bearberry	
cCanada buffalo-berry/ hairy wild rye (submesic/medium)	c1 Canada buffalo-berry/hairy wild rye Fd	c1.1 Fd/needle litter	E6a Fd/Needle litter	
		c1.2 Fd/hairy wild rye	E6 Fd/Hairy wildrye	
	c2 Canada buffalo-berry/hairy wild rye P1	c2.1 P1/Canada buffalo-berry/hairy wild rye	E5 Pl/Buffaloberry/Pinegrass E7 Pl/Dwarf bilberry/Hairy wildrye	
	c3 Canada buffalo-berry/hairy wild rye Aw	c3.1 Aw/hairy wild rye	F3 Aw-Pl/Buffaloberry/Hairy wildrye G2 Aw/Rose/Hairy wildrye G3 Aw/Hairy wildrye	
	c4 Canada buffalo-berry/hairy rye Aw-Sw-P1-Fd	c4.1 Aw-Sw-P1-Fd/hairy wild rye	F5 Aw-Sw/Blueberry	
	c5 grassland		B2 Idaho fescue-Parry oatgrass-Rough fescue B4 Rough fescue-Sedge/Bearberry E1 Pf/Rough fescue	

cc Rough fescue grassland (submesic/rich)	cc1 Rough fescue		A11. Rough fescue-Fringed brome-Sedge A12. Rough fescue-Sedge-Junegrass B1 Rough fescue-Idaho fescue-Parry oatgrass B15 Rough fescue-Hairy wildrye **Forest succession** B8 Fd/I.fescue-R.fescue B9 Fd/I.fescue-S.bluegrass B10 Aw/Strawberry/R. fescue A8 Prickly rose-Snowberry	A13. Sedge-Junegrass C1 I. fescue-P.oatgrass-Sedge C2 C. bluegrass-R. fescue C3 K. bluegrass-R. fescue C4 K.bluegrass-Timothy/Dandelion C5 S. brome-K.bluegrass C8 C. red fescue/Dandelion-Clover C9 R.fescue-K.bluegrass C10 R.fescue-Sedge-Mtn. brome
d creeping mahonia-white meadowsweet (mesic/medium)	d1 creeping mahonia-white meadowsweet Fd	d1.1 Fd/feather moss		E6b Fd/Timothy
		d1.2 Fd/white meadowsweet	E10 Sw-Fd/White meadowsweet E10a Fd/Snowberry F4a Fd-Aw/Pinegrass F6 Aw-Fd/White meadowsweet	
	d2 creeping mahonia-white meadowsweet P1	d2.1 P1/green alder		
		d2.2 P1/creeping mahonia-white meadowsweet	E8 Pl/White meadowsweet	
		d2.3 P1/pine grass	E9 Pl/Pinegrass F4 Aw-Pl/Pinegrass	
		d2.4 P1/mountain lover/bear grass		

		d2.5 P1/feather moss	E11 Pl/Moss	
	d3 creeping mahonia-white meadowsweet Sw	d3.1 Sw/feather moss	E12 Sw/Moss	A14 Creeping red fescue-Timothy
	d4 white meadowsweet Aw		G4 Aw/White meadowsweet/Pinegrass G5 Aw/Rose/Pinegrass	G6 Aw/Pinegrass-K. bluegrass
	d5 shrubland		A10. Bog birch-Sedge-Rough fescue	B16 Big sagebrush-Buckthorn/K. bluegrass C11Snowberry/K. bluegrass
	d6 pinegrass grassland		B7 Pinegrass-Hairy wildrye/Strawberry	
e thimbleberry/pine grass (mesic/rich)	e1 thimbleberry/pine grass P1	e1.1 Pl/thimbleberry	E13 Pl/Thimble berry E14 Pl/Thimbleberry/Beargrass E15 Pl/River alder/Thimbleberry	
	e2 thimbleberry/pine grass Aw	e2.1 Aw/thimbleberry	G10 Aw/Thimbleberry G11 Aw/Cow parsnip	
		e2.2 Aw/pine grass	F7 Aw-Pb-Sw/Pinegrass	G7 Aw/Timothy-K. bluegrass
		e2.3 Aw/saskatoon-snowberry	F8 Aw-Fa/Snowberry/Pinegrass G8 Aw/Snowberry-Saskatoon	F9 Pl-Aw/Snowberry/K. bluegrass F10 Aw-Fa-Se/Timothy G9 Aw/Snowberry/K. bluegrass

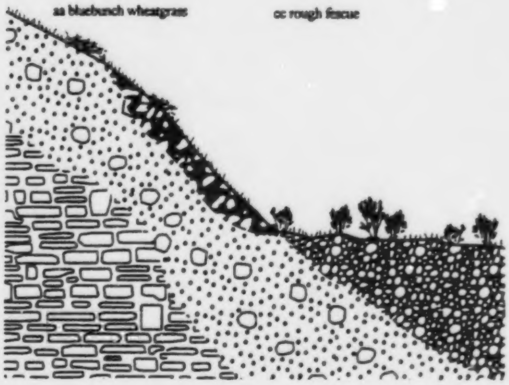
	e3 thimbleberry/pine grass Sw	e3.1 Sw/thimbleberry	E16 Sw/Thimbleberry	
	e4 shrubland		B11 Thimbleberry brush B14 Forb meadows	
f balsam poplar (subhygric/rich)	fl balsam poplar Pb	fl.1 Pb/snowberry	F11 Spruce-Pb/Snowberry G12 Pb/Thimbleberry G14 Pb/Snowberry G15 Aw/Birch-Willow	G13 Pb/Cow parsnip/K. bluegrass
g meadow (subhygric/very rich)	g1 shrubby meadow		D3 Beaked willow/Hairy wildrye D4 T.Honeysuckle-Rose-Willow/Nettle D5 G.alder-S.willow-Raspberry D10 Dwarf birch-S.cinquefoil/Valerian/Sedge D13 Water birch-Smooth willow/Pinegrass	D6 Flat lv'd willow/Quackgrass-K. bluegrass
	g2 grassy meadow		B13 Tufted hairgrass-Baltic rush A9 Tufted hairgrass-Sedge	
h horsetail (hygric/rich)	h1 horsetail Sw-Pb			
	h2 horsetail Sw		F12 Sw-Aw/Scouring rush	
	h3 horsetail shrubland		D7 Willow/Horsetail	

ij fen (subhydric/rich)	ij1 treed fen		E17 Sb-Lt/Labrador tea D12 Sb/Willow/Wire rush-Sedge/Moss	
	ij2 shrubby fen		D8 Willow/Sedge-Marsh reedgrass D9 Bog birch-Basket willow-Myrtle lv'd willow D11 Sw/Willow/Water sedge/Golden moss	
	ij3 graminoid fen		B12 Sedge meadows	

aa Bluebunch wheatgrass (n=50)

GENERAL DESCRIPTION

This ecosite is located on steep, south and west facing slopes throughout the Blairmore and Morley Foothills ecodistricts and the Banff and Jasper Mountain ecodistricts. The soils are poorly developed, nutrient poor and generally have xeric or subxeric moisture regimes. The grassland communities of the Banff and Jasper Mountain ecodistricts are often dominated by northern wheatgrass, junegrass, fringed sage, sheep fescue and upland sedge species. In contrast the Blairmore and Morley foothills ecodistricts are often dominated by bluebunch wheatgrass. Big sagebrush dominated communities are also found in isolated areas in the South Castle in this ecosite.



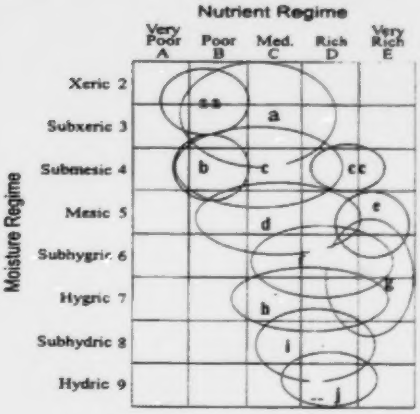
SUCCESSIONAL RELATIONSHIPS

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs such as saskatoon, snowberry and chokecherry, often invade the site with succession to Douglas fir. Heavy grazing pressure on the grasslands can often lead to a degraded site that is dominated by fringed sage, sedge, and little clubmoss. However, on moister sites timothy and Kentucky bluegrass can often invade into this ecosite

INDICATOR SPECIES

Rose
Saskatoon
Bearberry
Little clubmoss
Sedge
Chokecherry
Fringed sage
Small lv'd everlasting
Northern wheatgrass
Sheep fescue
Junegrass
Timothy
Bluebunch wheatgrass
Big sagebrush

subxeric/medium



SITE CHARACTERISTICS

Moisture regime: xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper, mid
Slope: (16-30%) (31-45%)(45-70%)
Aspect: south, southwest, west

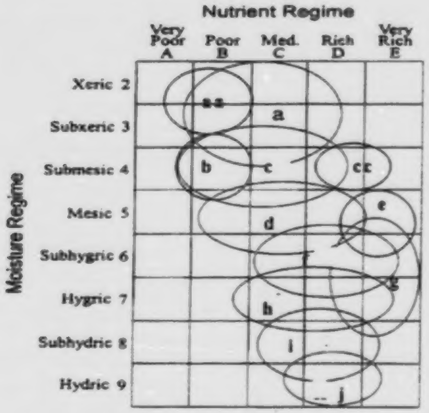
SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: CL,SiL
Effective texture: CL, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M
Soil subgroup: O.EB, O.R

ECOSITE PHASES

aa1 grassland (n=41)
aa1a grazed grassland (n=9)
aa2 big sagebrush (n=2)

aa1 grassland (n=44)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Shrub

[3]	Saskatoon*
[3]	Rose
[3]	Snowberry
[1]	Chokecherry
[2]	Bearberry
[5]	Fringed sage*
[1]	Shrubby cinquefoil
[3]	Juniper

Forb

[1]	Wild blue flax
[2]	Small lv'd everlasting
[2]	Yarrow
[1]	Silky perennial lupine
[2]	Little clubmoss

Grasses

[9]	Sedge species
[1]	Sheep fescue
[6]	Bluebunch wheatgrass*
[1]	Timothy
[13]	Northern wheatgrass*
[8]	Junegrass*
[2]	Hairy wildrye
[2]	Rough fescue
[1]	Richardson needlegrass

SITE CHARACTERISTICS

Moisture regime: xeric, subxeric, submesic
Nutrient regime: poor, medium, rich
Topographic position: crest, upper slope, midslope
Slope:(16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

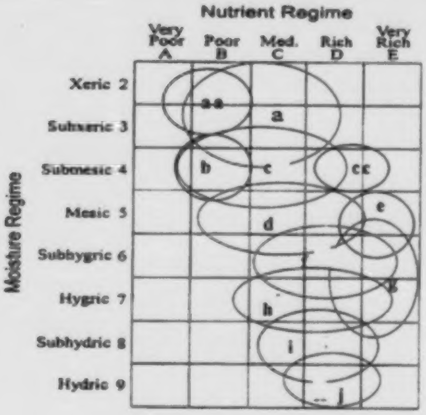
SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: CL, SiL
Effective texture: CL, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M, E
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A1 Fringed sage/Junegrass (n=11)
A2 Northern wheatgrass-Sheep fescue (n=2)
A3 Small lv'd everlasting/Junegrass (n=2)
A4 Creeping juniper/Northern wheatgrass-Columbia needlegrass (n=2)
A5 Little clubmoss/Richardson needlegrass (n=1)
B3 Bluebunch wheatgrass-Sedge (n=26)

aa1a Grazed grassland (n=9)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Shrub

[1]	Shrubby cinquefoil
[1]	Creeping juniper
[4]	Snowberry
[2]	Rose
[2]	Fringed sage*
[1]	Bearberry

Forb

[2]	Showy locoweed
[1]	Late yellow locoweed
[3]	Small leaved everlasting
[2]	Low goldenrod
[8]	Little clubmoss*
[4]	Moss phlox
[6]	Dandelion*

Grasses

[7]	Junegrass
[13]	Northern wheatgrass
[7]	Sedge
[15]	Kentucky bluegrass*
[1]	Rough fescue
[3]	Parry oatgrass

SITE CHARACTERISTICS

Moisture regime:, xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope: (16-30%) (31-45%)(45-70%)
Aspect: westerly, southrly

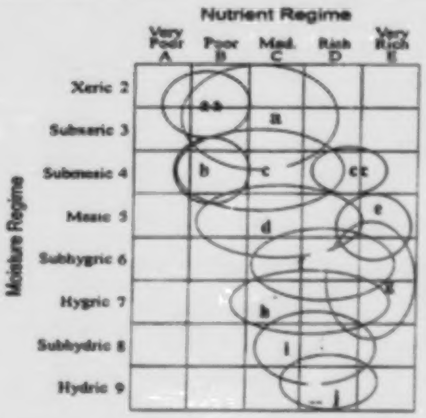
SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: SiL, CL
Effective texture: C, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A6 Kentucky bluegrass-Junegrass/Dandelion (n=3)
C6 Blunt sedge/Little clubmoss-Moss phlox(n=5)
C8 Northern wheatgrass-Kentucky bluegrass(n=1)

aa2 **big sagebrush** (n=4)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[21]	Big sagebrush*
[1]	Snowberry
[1]	Rose
[9]	Saskatoon
[22]	Bearberry*

Forb

[3]	Yarrow
[2]	Silky perennial lupine
[1]	Small leaved everlasting
[1]	Low goldenrod
[5]	Little clubmoss*
[3]	Wild bergamont
[2]	Smooth aster

Grasses

[3]	Junegrass
[5]	Bluebunch wheatgrass*
[1]	Sedge
[8]	Idaho fescue
[1]	Rough fescue
[4]	California oatgrass

SITE CHARACTERISTICS

Moisture regime:, xeric, subxeric, submesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope: (16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

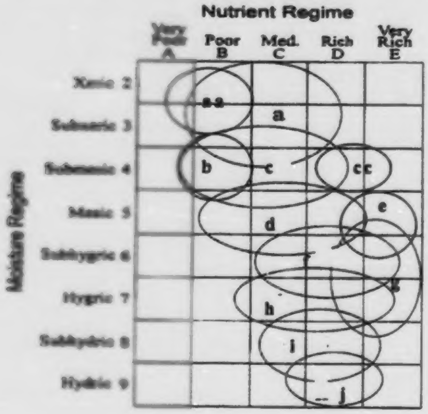
SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: mull
Surface texture: SiL, CL
Effective texture: C, SiC
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R

RANGE PLANT COMMUNITY TYPES

B5 Big sagebrush/Bluebunch wheatgrass-Sedge (n=4)

b4 yellow mountain avens (n=4)


Nutrient Regime
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Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Trees

[7]	Balsam poplar*
[14]	White spruce

Shrub

[24]	Yellow mountain avens*
[2]	Silverberry*
[1]	Shrubby cinquefoil
[2]	Buffaloberry
[1]	Bearberry

Forb

[2]	Yarrow
[2]	Lindley's aster
[1]	Cut leaved anemone
[1]	Showy locoweed

Grasses

[7]	Junegrass
[1]	Sedge
[1]	Canada bluegrass

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: poor, medium
Topographic position: level
Slope: (0-2%)
Aspect: westerly, southerly

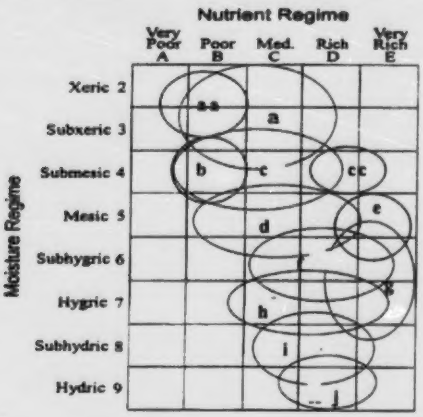
SOIL CHARACTERISTICS

Organic thickness: (0-2)
Humus form: no data
Surface texture: S
Effective texture: S
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F
Soil subgroup: O.R

RANGE PLANT COMMUNITY TYPES

D1 Yellow mtn. avens-River alder/Low forb(n=1)
D2 Yellow mtn. avens/Junegrass (n=2)
F2 Sw-Pl-Pb/Yellow mtn. avens (n=1)

b5 bearberry grassland (n=73)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Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[1] Juniper spp.
[3] Rose
[1] Shrubby cinquefoil
[2] Snowberry
[3] Saskatoon
[24] Bearberry*

Forb

[1] Yarrow
[1] Lindley's aster
[1] Cut leaved anemone
[1] Showy locoweed
[1] Small leaved everlasting*
[2] Strawberry

Grasses

[2] Junegrass
[2] Northern wheatgrass
[2] Rough fescue
[2] Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: subxeric, submesic, mesic
Nutrient regime: poor, medium
Topographic position: crest, upper slope, midslope
Slope:(0-2%)(16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

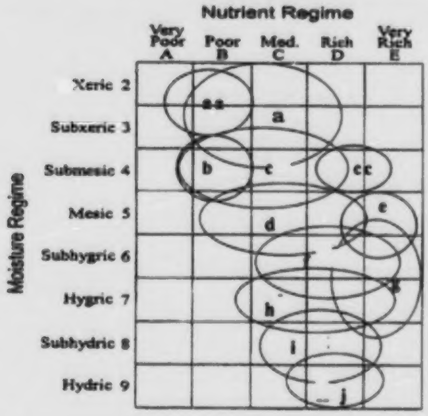
SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: no data
Surface texture: L
Effective texture: L
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C, M
Soil subgroup: O.R, O.EB

RANGE PLANT COMMUNITY TYPES

A7 Bearberry/Juniper (n=17)
B6 Snowberry-Rose-Saskatoon/Bearberry (n=56)

c5 grassland (n=82)


Nutrient Regime
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Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Trees

[2]	Limber pine

Shrub

[2]	Saskatoon
[2]	Rose
[1]	Snowberry
[15]	Bearberry*
[1]	Fringed sage
[2]	Shrubby cinquefoil
[1]	Juniper

Forb

[2]	Strawberry
[2]	Old mans whisker's
[3]	Cut leaved anemone
[1]	Woolly gromwell
[1]	Yarrow
[2]	Silky perennial lupine
[1]	Little clubmoss

Grasses

[3]	Sedge species
[17]	Rough fescue
[11]	Idaho fescue*
[1]	Slender wheatgrass
[11]	Parry oatgrass*
[2]	Junegrass*

SITE CHARACTERISTICS

Moisture regime: subxeric, submesic
Nutrient regime: medium, rich
Topographic position: crest, upper slope, midslope
Slope:(0-2%) (16-30%) (31-45%)(45-70%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L
Effective texture: CL, SiCL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: C,M,T
Soil subgroup: O.MB

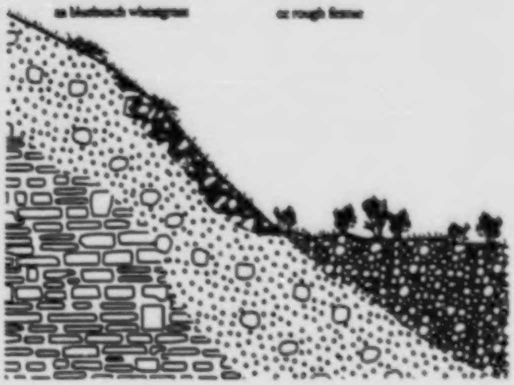
RANGE PLANT COMMUNITY TYPES

B2 Idaho fescue-Parry oatgrass-Rough fescue(n=37)
B4 Rough fescue-Sedge/Bearberry (n=44)
E1 Pf/Rough fescue (n=1)

cc rough fescue grassland (n=349)

GENERAL DESCRIPTION

This ecosite is typical of south and west facing slopes and lower slope positions throughout the Montane subregion from an elevation of 1300 m to 1900 m. This ecosite is usually dominated by grass species because of the dry site conditions and westerly winds. The soils of this ecosite are dominated by deep black chernozemic soils. A number of rough fescue dominated sites have not had the species composition change in over 30 years of no disturbance indicating the climax nature of this ecosite in the Montane subregion.



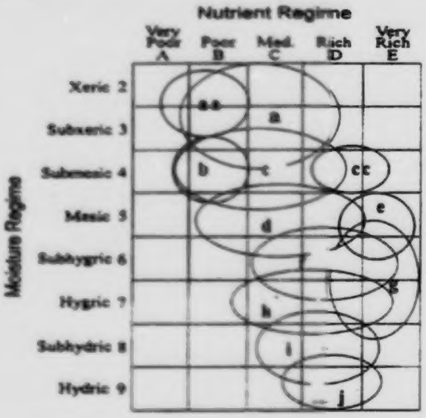
SUCCESSIONAL RELATIONSHIPS

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs and trees such as saskatoon, snowberry, chokecherry and aspen often invade the site with succession to Douglas fir and Lodgepole pine. Heavy grazing pressure on these grasslands can often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and clover species. Many sites within this ecosite have been cultivated and are dominated by cereal crops and smooth brome.

INDICATOR SPECIES

Shrubby cinquefoil
Old mans whisker's
Sticky purple geranium
Woolly gromwell
Bearberry
Cut leaved anemone
Mountain shooting star
Rough fescue
Junegrass
Parry oatgrass
Kentucky bluegrass
Idaho fescue
Slender wheatgrass
Timothy

submesic/rich



SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: rich, medium
Topographic position: crest, midslope, lower slope
Slope: (0-2%)[5](16-30%)[3] (31-45%)[8](45-70%)[1]
Aspect: south, southwest, west

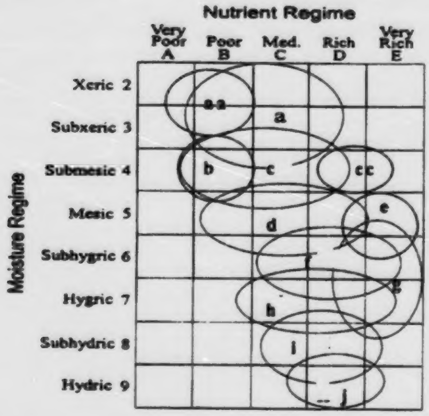
SOIL CHARACTERISTICS

Organic thickness: (0-2)(2-5)
Humus form: mull
Surface texture: CL,SiL, L
Effective texture: CL, SiL, SL,
Depth to Mottles/Gley: none
Drainage: well
Parent material: F, GF, M
Soil subgroup: O.BL, O.DG, O.MB

ECOSITE PHASES

cc1 rough fescue (n=118)
cc1a grazed rough fescue (n=231)

ccl rough fescue (n=118)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Shrub

[3]	Snowberry
[1]	Saskatoon
[1]	Rose
[3]	Shrubby cinquefoil
[1]	Juniper

Forb

[3]	Strawberry
[4]	Old mans whisker's
[2]	Cut leaved anemone
[1]	Woolly gromwell
[2]	Yarrow
[2]	Silky perennial lupine
[3]	Yellow beardtongue
[1]	Shooting star

Grasses

[5]	Sedge species
[29]	Rough fescue*
[9]	Idaho fescue*
[2]	Slender wheatgrass
[10]	Parry oatgrass*
[2]	Junegrass
[1]	Fringed brome

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, rich
Topographic position: level, midslope, lower slope
Slope:(0-2%)^4 (16-30%)^3 (31-45%)^1(45-70%)^1
Aspect: westerly, southerly

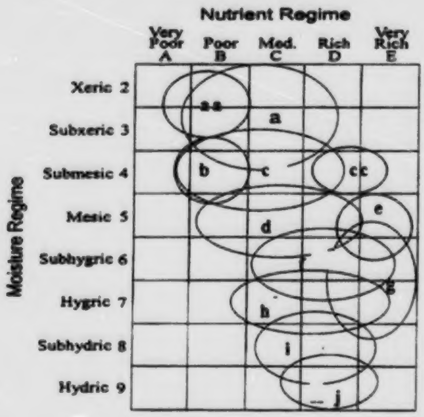
SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

A8 Prickly rose-Snowberry (n=6)
A11 Rough fescue-Fringed brome-Sedge (n=5)
A12 Rough fescue-Sedge-Junegrass (n=2)
B1 Rough fescue-Idaho fescue-Parry oatgrass (n=99)
B8 Fd/I.fescue-Rough fescue (n=3)
B9 Fd/Idaho fescue-Sandberg bluegrass(n=1)
B10 Aw/Strawberry/Rough fescue (n=1)
B15 Rough fescue-Hairy wildrye (n=1)

cc1a grazed rough fescue (n=231)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Shrub

[1]	Rose
[3]	Shrubby cinquefoil

Forb

[2]	Strawberry
[10]	Old mans whisker's
[2]	Cut leaved anemone
[5]	Yarrow
[10]	Dandelion
[3]	Yellow beardtongue
[3]	Shooting star
[5]	Graceful cinquefoil

Grasses

[5]	Sedge species
[12]	Rough fescue*
[15]	Idaho fescue*
[20]	Kentucky bluegrass*
[10]	Parry oatgrass*
[12]	Timothy*
[2]	Canada bluegrass

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, rich
Topographic position: level, midslope, lower slope
Slope:(0-2%)^4 (16-30%)^3 (31-45%)^1(45-70%)^1
Aspect: westerly, southerly

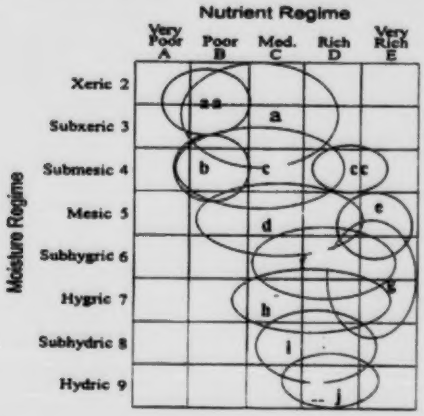
SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

A13 Sedge-Junegrass (n=2)
C1 Idaho fescue-Parry oatgrass-Sedge (n=30)
C2 Canada bluegrass-Rough fescue (n=13)
C3 Kentucky bluegrass-Rough fescue(n=63)
C4 Kentucky bluegrass-Timothy/Dandelion (n=74)
C5 Smooth brome-Kentucky bluegrass (n=14)
C7 Creeping red fescue/Dandelion-Clover (n=10)
C9 Rough fescue-Kentucky bluegrass (n=25)
C10 Rough fescue-Sedge-Mountain brome (n=2)

d3a cultivated hairy wildrye Sw (n=2)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[2]	Willow spp.

Forb

[2]	Fireweed
[1]	Tall larkspur

Grasses

[6]	Sedge species
[2]	Kentucky bluegrass*
[18]	Creeping red fescue*
[10]	Hairy wildrye
[8]	Timothy*

SITE CHARACTERISTICS

Moisture regime: submesic, mesic
Nutrient regime: medium, poor
Topographic position: midslope, upper slope
Slope:[3] (31-45%)(45-70%)
Aspect: variable

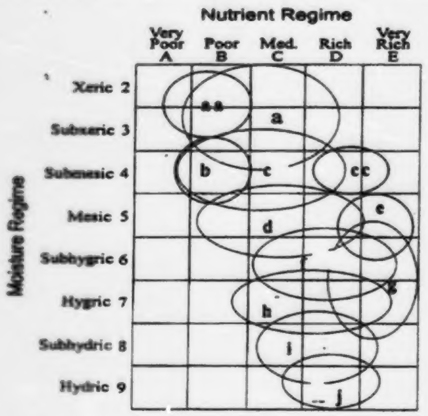
SOIL CHARACTERISTICS

Organic thickness: (0-5-2)(2-5))
Humus form: mor
Surface texture: SiL, L, CL
Effective texture: L, SiL
Depth to Mottles/Gley: none
Drainage: well
Parent material: F, M
Soil subgroup: O.EB

RANGE PLANT COMMUNITY TYPES

A14 Creeping red fescue-Timothy (n=2)

d4 white meadowsweet Aw (n=44)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Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
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CHARACTERISTIC SPECIES

Trees

[47]	Aspen
[2]	Lodgepole pine

Shrub

[9]	White meadowsweet
[6]	Rose

Forb

[6]	Showy aster
[8]	Strawberry
[5]	Yellow peavine
[2]	Northern bedstraw
[4]	Lindley's aster

Grasses

[19]	Pinegrass
[1]	Sedge
[5]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium, poor, rich
Topographic position: midslope, lower slope
Slope: (0-5%)(10-25%)
Aspect: variable

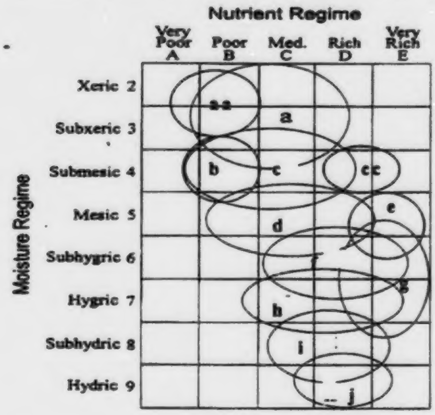
SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor
Surface texture: SiL, L, SL
Effective texture: L, SCL, SiCL, SL, SiL
Depth to Mottles/Gley: none (26-50)
Drainage: well, mod. well
Parent material: X, M, GF
Soil subgroup: O.EB, E.EB, O.GL

RANGE PLANT COMMUNITY TYPES

G4 Aw/White meadowsweet/Pinegrass (n=10)
G5 Aw/Rose/Pinegrass (n=34)

d4a grazed Aw (n=4)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
a
a
b
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c
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e
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i
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CHARACTERISTIC SPECIES

Trees

[21]	Aspen

Shrub

[8]	Wild red raspberry
[8]	Rose

Forb

[6]	Smooth aster
[7]	Strawberry
[6]	Yellow peavine
[10]	Wild white geranium
[3]	Dandelion

Grasses

[22]	Pinegrass
[23]	Kentucky bluegrass
[3]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium
Topographic position: lower slope
Slope: (3-23%)
Aspect: southerly

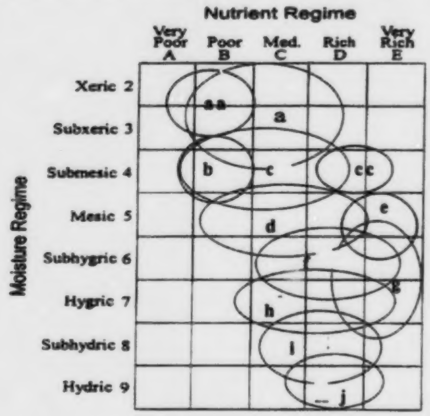
SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor
Surface texture: SiL, L, SL
Effective texture: L, SCL, SiCL, SL, SiL
Depth to Mottles/Gley: none (26-50)
Drainage: well, mod. well
Parent material: X, M, GF
Soil subgroup: O.EB, E.EB, O.GL

RANGE PLANT COMMUNITY TYPES

G6 Aw/Pinegrass-Kentucky bluegrass(n=4)

d5 shrubland (n=1)



CHARACTERISTIC SPECIES

Shrub

[30]	Bog birch
[7]	Shrubby cinquefoil

Forb

[3]	Yarrow
[2]	Small leaved everlasting
[4]	Cut leaved anemone
[4]	Heart leaved Alexander
[3]	Old mans whisker's
[3]	American vetch

Grasses

[12]	Sedge
[2]	Rough fescue
[4]	Sheep fescue
[3]	Junegrass

SITE CHARACTERISTICS

Moisture regime: mesic
Nutrient regime: medium
Topographic position: lowerslope
Slope: (0-2)
Aspect: southerly

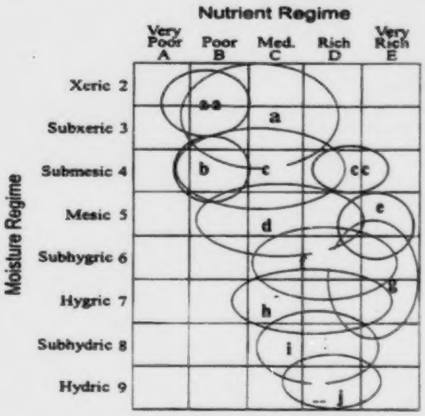
SOIL CHARACTERISTICS

Organic thickness: (0-5)(2-5)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: L, SiL
Depth to Mottles/Gley: none
Drainage: well
Parent material: F,
Soil subgroup: O.EB

RANGE PLANT COMMUNITY TYPES

A10 Bog birch/Sedge-Rough fescue (n=1)

d5a grazed shrubland (n=3)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
a-a
a
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CHARACTERISTIC SPECIES

Shrub

[19]	Big sagebrush
[18]	Snowberry
[7]	Buckthorn

Forb

[6]	Strawberry
[20]	Yellow beardstongue
[5]	Yarrow
[3]	Dandelion
[2]	Star flowered solomon's seal
[1]	American vetch

Grasses

[1]	Sedge species
[25]	Kentucky bluegrass*
[6]	Timothy*

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, lower slope
Slope:(1-10%)
Aspect: westerly, southerly

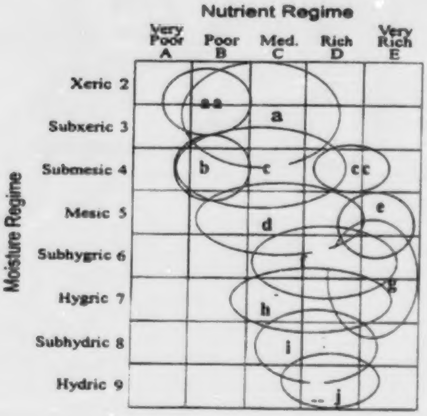
SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.MB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

B16 Big sagebruch-Buckthorn/Kentucky bluegrass (n=2)
C11 Snowberry/Kentucky bluegrass (n=1)

d6 pinegrass grassland (n=11)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[2] Snowberry
[2] Rose
[2] White meadowsweet

Forb

[13] Strawberry
[4] Yellow peavine
[5] Silky perennial lupine
[5] Showy aster

Grasses

[23] Pinegrass
[7] Hairy wildrye
[1] Northern awnless brome

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-46%)
Aspect: northerly^5, westerly^4, southerly^1

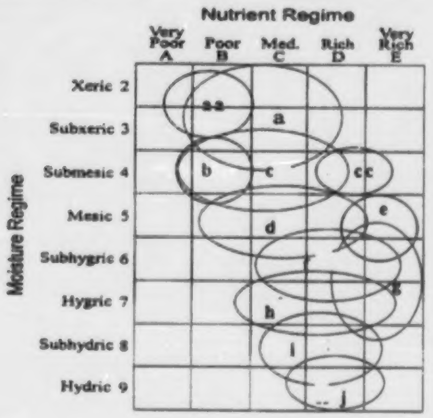
SOIL CHARACTERISTICS

Organic thickness: (0-2)(0-4)
Humus form: mull
Surface texture: SiL, L, CL
Effective texture: CL, SiL, SL
Depth to Mottles/Gley: none
Drainage: rapid, well
Parent material: F, GF, M
Soil subgroup: O.EB, O.BL, O.DG

RANGE PLANT COMMUNITY TYPES

B7 Pinegrass-Hairy wildrye/Strawberry (n=11)

e2a grazed aspen (n=9)



CHARACTERISTIC SPECIES

Trees

[60]	Aspen
[9]	Lodgepole pine

Shrub

[3]	Rose
[30]	Snowberry
[5]	Thimbleberry
[2]	Saskatoon

Forb

[8]	Strawberry
[5]	Clover
[5]	Smooth aster
[20]	Dandelion
[8]	Wild white geranium
[2]	American vetch
[2]	Veiny meadow rue

Grasses

[2]	Mountain brome
[20]	Kentucky bluegrass*
[18]	Timothy*
[4]	Pinegrass

SITE CHARACTERISTICS

Moisture regime: mesic^{8}, submesic^{1}
Nutrient regime: medium^{8}, rich^{2}
Topographic position: level, lower slope
Slope:(0-4%)^{8}(20-26%)^{2}
Aspect: westerly, southerly

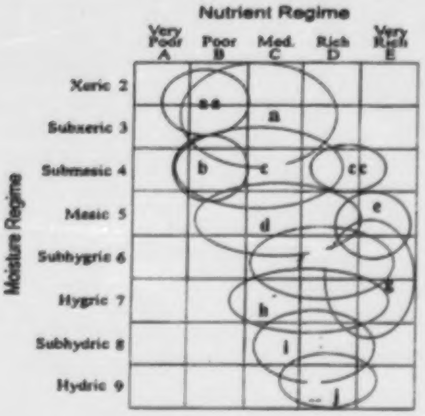
SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: mor
Surface texture: L, SL, CL
Effective texture: CL, SCL, L
Depth to Mottles/Gley: none
Drainage: mod.well, well
Parent material: F, GF, M
Soil subgroup: O.EB, O.BL, CU.R, O.DG, O.MB

RANGE PLANT COMMUNITY TYPES

G7 Aw/Timothy-Kentucky bluegrass (n=4)
G9 Aw/Snowberry/Kentucky bluegrass (n=2)
F9 Pl-Aw/Snowberry/Kentucky bluegrass (n=1)
F10 Aw-Fa-Se/Timothy (n=2)

e4 shrubland (n=5)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
aa
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CHARACTERISTIC SPECIES

Shrub

[1] Rose
[8] Snowberry
[30] Thimbleberry

Forb

[8] Strawberry
[6] Lindleys aster
[4] Showy aster
[2] Fireweed
[2] Baneberry
[2] Yellow peavine
[8] Wild bergamont
[3] Star flowered solomon seal

Grasses

[2] Rough fescue
[1] Fringed brome
[3] Idaho fescue
[4] Pinegrass
[2] Parry oatgrass
[2] Slender wheatgrass

SITE CHARACTERISTICS

Moisture regime: mesic^{3}, subhygric^{3}
Nutrient regime: medium^{2}, rich^{3}
Topographic position: level, lower slope, midslope
Slope:(0-4%)^{3}(20-26%)^{2}(35-47)
Aspect: variable

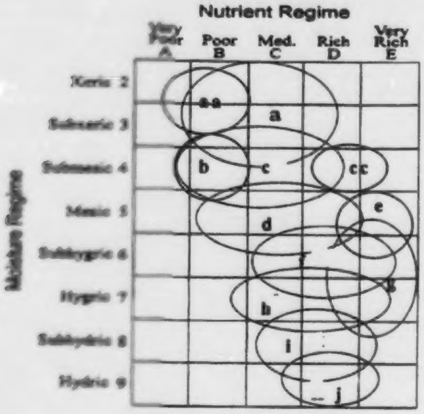
SOIL CHARACTERISTICS

Organic thickness: (0-5)(6-15)
Humus form: mor, raw moder
Surface texture: L, SL, CL
Effective texture: CL, SiCL, SC L
Depth to Mottles/Gley: none
Drainage: mod.well, well
Parent material: F, M
Soil subgroup: O.GL, O.EB, O.B

RANGE PLANT COMMUNITY TYPES

B11 Thimbleberry brush (n=3)
B13 Forb meadows (n=2)

f1a grazed balsam poplar (n=1)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Trees

[75] Balsam poplar

Shrub

[5] Rose
[9] Sticky currant

Forb

[26] Showy aster
[8] Cow parsnip
[25] Canada violet
[11] Sweet cicely
[6] Veiny meadow rue

Grasses

[11] Sedge
[10] Kentucky bluegrass*

SITE CHARACTERISTICS

Moisture regime: subhygric
Nutrient regime: rich
Topographic position: level, lower slope
Slope:(0-3%)
Aspect: westerly, southerly

SOIL CHARACTERISTICS

Organic thickness: (0-5)
Humus form: moder
Surface texture: L,
Effective texture: CL
Depth to Mottles/Gley: none
Drainage: mod.well,
Parent material: GF
Soil subgroup: not available

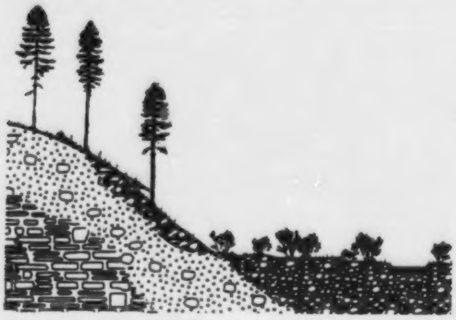
RANGE PLANT COMMUNITY TYPES

G13 Pb/Cow parsnip/Kentucky bluegrass (n=1)

g meadow (n=10)(taken from Ecosites of West-Central Alberta)

GENERAL DESCRIPTION

The meadow ecosite tends to be mesic to subhygric and occurs on fluvial parent materials where flooding and/or high water tables increase soil water content and replenish nutrients. The soils on these sites tend to have thick Ah horizons and loamy textures.



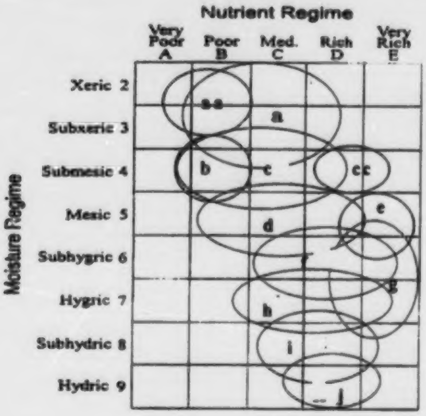
SUCCESSIONAL RELATIONSHIPS

The meadow ecosite is successional stable. Disturbance regime, cold air drainage, and competition from a diverse cover of shrubs, forbs and grasses slow or inhibit the establishment of trees. If trees become established, the rich, moist loamy soils are conducive to rapid growth.

INDICATOR SPECIES

Willow	Cow parsnip
Veiny meadow rue	Avens
Tufted hairgrass	Marsh reedgrass
Slender wheatgrass	Sedge

subhygric/very rich



SITE CHARACTERISTICS

Moisture regime: subhydric, hygric,mesic
Nutrient regime: rich, very rich, medium
Topographic position: level, depression, toe
Slope: level, (2-5%)
Aspect: level, southerly, easterly

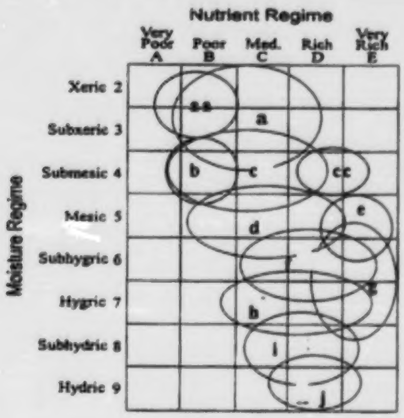
SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

ECOSITE PHASES

g1 shrubby meadow (n=8)
g1a grazed shrubby meadow (n=2)
g2 grassy meadow (n=2)

g1 shrubby meadow (n=8)



CHARACTERISTIC SPECIES

Shrub

[14]	Green alder
[8]	Bog birch
[27]	Willow
[9]	Raspberry

Forb

[1]	Strawberry
[1]	Fireweed
[5]	Stinging nettle
[2]	Marsh valerian

Grasses

[11]	Sedge
[4]	Hairy wildrye
[4]	Tufted hairgrass
[4]	Timothy

SITE CHARACTERISTICS

Moisture regime: mesic, subhygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-5%)
Aspect: variable

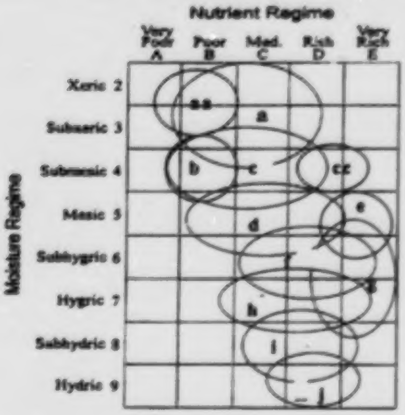
SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

RANGE PLANT COMMUNITY TYPES

D3 Beaked willow/Hairy wildrye (n=2)
D4 Twinning honeysuckle-Rose-Willow/Nettle (n=1)
D5 Green alder-Scoulers willow-Raspberry(n=2)
D10 Dwarf birch-Shrubby cinquefoil/Marsh valerian/Sedge (n=2)
D13 Water birch-Smooth willow/Pinegrass(n=1)

g1a grazed shrubby meadow (n=2)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[44]	Flat leaved willow
[1]	Bog birch

Forb

[3]	Marsh violet
[2]	Rush aster

Grasses

[6]	Sedge
[27]	Kentucky bluegrass
[18]	Quackgrass
[4]	Alpine rush

SITE CHARACTERISTICS

Moisture regime: mesic, hygric
Nutrient regime: medium, rich
Topographic position: level, mid slope, lower slope
Slope:(0-2%)
Aspect: variable

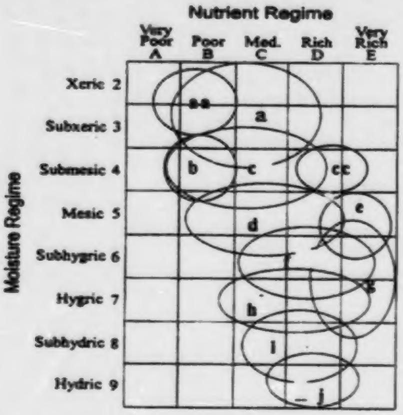
SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL,
Effective texture: SiC, SiCL,
Depth to Mottles/Gley: not available
Drainage: poor, well
Parent material: F,
Soil subgroup:R.HG, O.R,

RANGE PLANT COMMUNITY TYPES

D6 Flat leaved willow/Quackgrass-Kentucky bluegrass(n=2)

g2 grassy meadow (n=2)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Shrub

[10]	Shrubby cinquefoil

Forb

[10]	Old mans whisker's
[4]	Veiny meadow
[12]	Graceful cinquefoil
[2]	Yellow beardstongue

Grasses

[25]	Sedge
[2]	Hairy wildrye
[20]	Tufted hairgrass
[6]	Slender wheatgrass
[12]	Idaho fescue

SITE CHARACTERISTICS

Moisture regime: hygric, subhygric
Nutrient regime: rich
Topographic position: level, lower slope
Slope:(0-5%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (6-15)(0-5)
Humus form: mor, mull, raw moder
Surface texture: SiC, L, CL, SiL, SL, SCL
Effective texture: SiC, SiCL, SiL, SL, SCL, L
Depth to Mottles/Gley: (0-25),(51-100),none,(26-50)
Drainage: imperfect, poor, mod. well, well
Parent material: F,
Soil subgroup:R.HG, O.R, GLCU.R, CU.HR

RANGE PLANT COMMUNITY TYPES

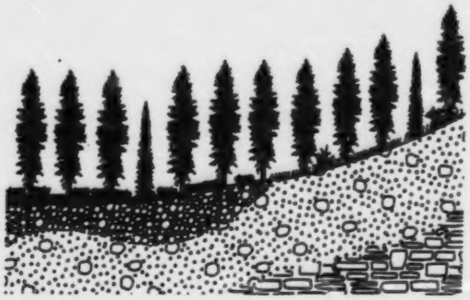
A9 Tufted hairgrass-Sedge(n=1)
B13 Tufted hairgrass-Baltic rush (n=1)

h horsetail (n=2)(taken from Ecosites of West-Central Alberta)

hygric/rich

GENERAL DESCRIPTION

The horsetail ecosite is wet and nutrient rich. These sites are commonly found on toe and lower slope positions with fluvial parent materials where flooding or seepage periodically replenishes the substrate nutrient availability. With wet soils gleysolic soils are common and organic matter tends to accumulate. Mottles were within 25 cm of the soil surface in over 80% of the sites. Horsetails commonly form a blanket over the forest floor.

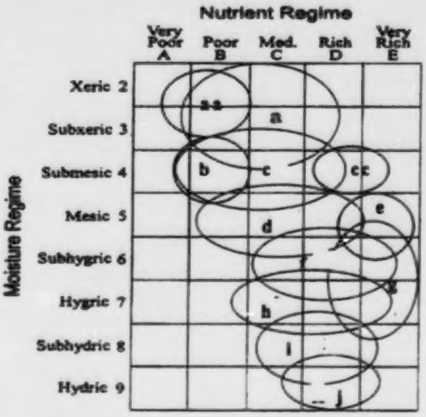


SUCCESSIONAL RELATIONSHIPS

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species, however its establishment may be slow due to high vegetation cover.

INDICATOR SPECIES

Meadow horsetail
Common horsetail
White spruce
Black spruce
Balsam poplar
Aspen
Willow


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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SITE CHARACTERISTICS

Moisture regime: subhygric, hygric
Nutrient regime: rich, very rich
Topographic position: level, depression, toe
Slope: level, (0-1%)
Aspect: level, southerly, easterly

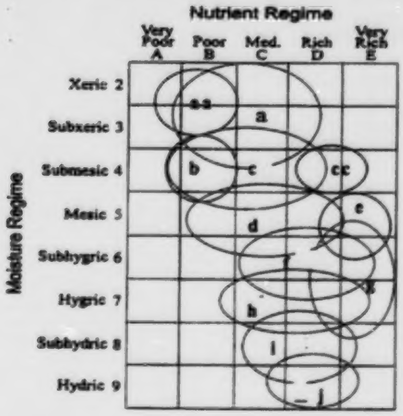
SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

ECOSITE PHASES

h2 horsetail Sw (n=1)
h3 horsetail shrubland (n=1)

h2 horsetail Sw (n=1)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Very Rich E
Moisture Regime
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Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
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CHARACTERISTIC SPECIES

Trees

[60]	White spruce
[15]	Aspen
[10]	Balsam poplar

Shrub

[3]	Rose

Forb

[4]	Dandelion
[20]	Dwarf scouring rush
[4]	Lindley's aster
[1]	American vetch

Grasses

[7]	Kentucky bluegrass
[5]	Hairy wildrye

SITE CHARACTERISTICS

Moisture regime: subhygric
Nutrient regime: rich
Topographic position: level
Slope: level
Aspect: variable

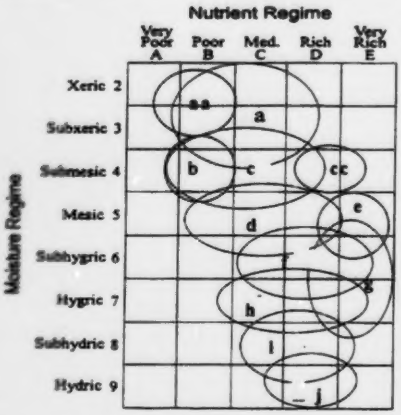
SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

RANGE PLANT COMMUNITY TYPES

F12 Sw-Aw/Scouring rush (n=1)

h3 horsetail shrubland (n=1)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Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
aa
a
b
c
cc
d
e
f
g
h
i
j

CHARACTERISTIC SPECIES

Shrub

[40]	Willow
[1]	Red osier dogwood
[1]	Rose

Forb

[40]	Field horsetail
[1]	Sweet scented bedstraw
[1]	Tall lungwort
[1]	Dandelion

SITE CHARACTERISTICS

Moisture regime: hygric
Nutrient regime: rich
Topographic position: level
Slope: level
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (26-39)(60-79)(16-25))
Humus form: moder, peaty mor
Surface texture: mesic, SiL, SiC, Si
Effective texture: humic, SiL, SiC, Si
Depth to Mottles/Gley: (0-25)
Drainage: imperfect, poor, mod. well, well
Parent material: F, FL, E
Soil subgroup:R.HG, O.R, GLCU.R, GL.R

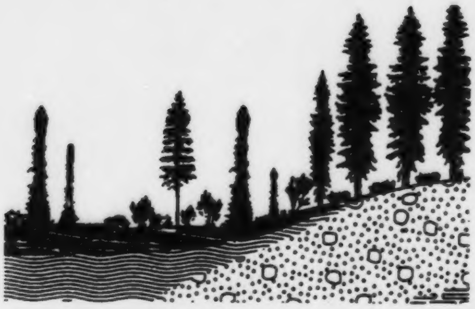
RANGE PLANT COMMUNITY TYPES

D7 Willow/Horsetail (n=1)

ij fen (n=21)(taken from Ecosites of West-Central Alberta)

GENERAL DESCRIPTION

The rich and poor fen are combined in this ecosite. The fen ecosite is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. This ecosite occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance the accumulation of organic matter consisting of sedges, golden moss, tufted moss, and brown moss. Black spruce, white spruce, and/or tamarack dominate the sparse canopy on the treed phase. Dwarf birch or willow form the canopy of the shrubby phase and sedges dominate the graminoid phase of this ecosite.



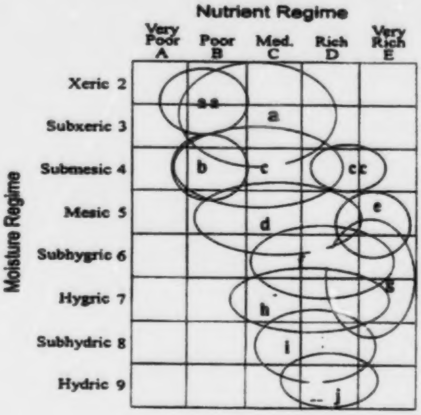
SUCCESSIONAL RELATIONSHIPS

Black spruce or white spruce are the edaphic climax trees on this ecosite. On calcareous materials black spruce may be replaced by white spruce as the climax tree species. Species composition and direction of succession changes with changing hydrologic regime. As with other wetlands, fens have slow successional rates so recovery from disturbance may also be slow.

INDICATOR SPECIES

Black spruce
tamarack
Willow
Labrador tea
Dwarf birch
Horsetail
Sedge
Golden moss
Brown moss
Tufted moss

subhydric/rich



SITE CHARACTERISTICS

Moisture regime: subhygric, hygric, subhydric,hydric
Nutrient regime: rich, very rich, medium
Topographic position: level, depression, toe
Slope: level, (0-1%)
Aspect: level, southerly, easterly

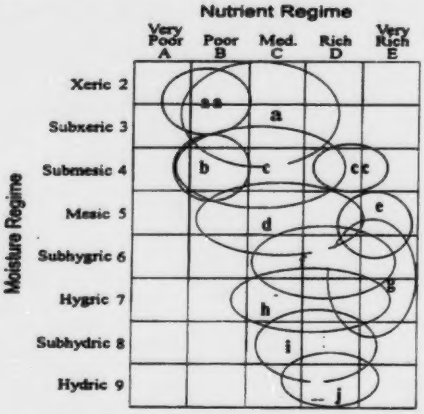
SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

ECOSITE PHASES

ij treed fen (n=4)
ij shrubby fen (n=14)
ij graminoid fen (n=3)

ij1 treed fen (n=4)


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
aa
a
b
c
cc
d
e
f
g
h
i
j

CHARACTERISTIC SPECIES

Trees

[25]	Black spruce
[20]	White spruce
[5]	Larch

Shrub

[20]	Willow
[6]	Labrador tea
[2]	Dwarf birch

Forb

[1]	Field horsetail
[1]	Sweet scented bedstraw
[3]	Scouring rush
[1]	Dandelion

Grass

[20]	Sedge
[1]	Hairy wildrye
[7]	Wire rush

Moss

[10]	Golden moss

SITE CHARACTERISTICS

Moisture regime: subhygric, subhydric
Nutrient regime: rich, poor, medium
Topographic position: level, depression
Slope: level
Aspect: variable

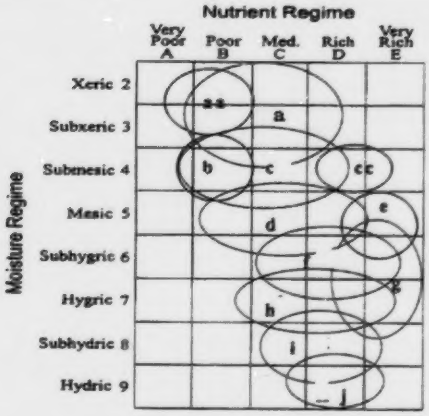
SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

D12 Sb/Willow/Wire rush-Sedge/Moss (n=3)
E17 Sb-Lt/Labrador tea(n=1)

ij2 shrubby fen (n=13)



CHARACTERISTIC SPECIES

Trees

[2]	Aspen

Shrub

[20]	Willow
[4]	Shrubby cinquefoil
[14]	Dwarf birch

Forb

[2]	Lindley's aster
[2]	Strawberry
[1]	Arrow leaved coltsfoot
[1]	Fireweed

Grass

[22]	Sedge
[2]	Tufted hairgrass
[5]	Wire rush
[2]	Marsh reedgrass

Moss

[4]	Golden moss

SITE CHARACTERISTICS

Moisture regime: subhygric, subhydric
Nutrient regime: very rich, rich medium
Topographic position: level, depression
Slope: level, (0-2%)
Aspect: variable

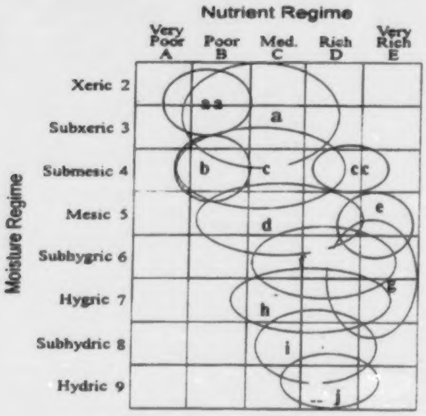
SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor, very poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

D8 Willow/Sedge-Marsh reedgrass (n=6)
D9 Bog birch-Willow (n=5)
D11 Sw/Willow/Water sedge/Golden moss (n=2)

ij3 graminoid fen (n=3)


Nutrient Regime
Very Poor
A
Poor
B
Med.
C
Rich
D
Very Rich
E
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
Moisture Regime
aa
a
b
c
cc
d
e
f
g
h
i
j

CHARACTERISTIC SPECIES

Shrub

[1] Willow

Forb

[5] Purple avens
[3] Smooth aster
[4] Swamp horsetail
[1] Fireweed

Grass

[43] Sedge
[7] Fowl bluegrass
[9] Wire rush
[6] Marsh reedgrass

SITE CHARACTERISTICS

Moisture regime: hygric, subhydric
Nutrient regime: very rich, rich
Topographic position: level, depression
Slope: level, (0-2%)
Aspect: variable

SOIL CHARACTERISTICS

Organic thickness: (>80)(60-79)
Humus form: mor, peaty mor
Surface texture: fibric, mesic
Effective texture: fibric, mesic
Depth to Mottles/Gley: not applicable
Drainage: imperfect, poor
Parent material: O
Soil subgroup:R.G, TY.M, TY.F, T.M, T.F, R.HG, O.HG, O.G, FI.M

RANGE PLANT COMMUNITY TYPES

B12 Sedge meadows (n=3)

Results

The analysis of the 1033 plots distinguished 115 community types. These types were split into 8 categories:

A. Native grasslands (Banff and Jasper Mountain ecodistricts)	14 types
B. Native grasslands (Blairmore and Morley Foothills ecodistricts)	16 types
C. Disturbed grasslands (Blairmore and Morley Foothills ecodistricts)	11 types
D. Native shrublands	13 types
E. Conifer types	24 types
F. Mixedwood types	13 types
G. Decidous types	16 types
H. Cutblocks	8 types

The dominant plant species, canopy cover, environmental conditions, forage production and carrying capacity are outlined for each community type.

Montane grassland ecology

The Montane subregion has highly variable ecological conditions. Much of the variation is the result of complex topography, while the small size of individual ecosystems results in a strong ecotonal effect from the surrounding environments (Strong 1992). Much of the grassland vegetation occurs on south and west facing slopes where seasonally low rainfall coupled with high evapotranspiration, dries the soil sufficiently to kill tree seedlings (Daubenmire 1978). Fire is also an important factor in determining the composition of grasslands because of the high flammability of the vegetation during the dry periods. A lack of fire and an increase in annual precipitation favours the growth of trees onto the more mesic sites.

The Whaleback ridge, Porcupine Hills and south into the Castle area are composed of a mixture of rough fescue grassland, aspen, Douglas fir and lodgepole pine. This area is characteristic of the Blairmore and Morley Foothills ecodistricts (Strong and Thompson 1995) an area of ridged and rolling hills, with moderate slopes (6-30%) and Black Chernozemic soils on submesic to mesic sites. In the Banff and Jasper river valleys and northern Montane areas (Grande Cache, Red Deer river valley) open Douglas fir, lodgepole pine and Fringed sage/Junegrass communities are common on steep south facing slopes, shallow rocky soils and coarse textured outwash (Strong 1992). These areas are typical of the Banff and Jasper Mountain ecodistricts. These ecodistricts have steep slopes (10-45%) and are dominated by Eutric Brunisolic soils, with submesic to xeric moisture regimes (Strong 1992). The grassland community types of the Montane subregion are outlined in Table 2.

Banff and Jasper Mountain ecodistricts

The two dominant grassland communities in Banff and Jasper National Park include the Fringed sage/Junegrass and Northern wheatgrass-Sheep fescue community types. These communities are typical of steep, south and westerly facing slopes with xeric to subxeric moisture regimes. The soils are poorly developed and nutrient poor. Variants of these community types included the Pussy toes/Junegrass community, which is also found on shallow, south facing slopes and the Juniper/Northern wheatgrass community which is typical of regosolic, eolian sand dunes of the Athabasca river valley near Jasper (Corns and Achuff 1982). A Little clubmoss/Richardson needlgrass community was also found on shallow south facing slopes in small isolated areas within the fir, white spruce, lodgepole pine and douglas fir forests.

A Kentucky bluegrass-Junegrass/Dandelion community type was described on lower to level slope positions with submesic to subxeric moisture regimes. The presence of a high cover of Junegrass indicates the close affinity this grassland has with the Fringed sage/Junegrass community type. The high cover of Kentucky bluegrass is indicative of heavy grazing influence on this community type.

There were two upland shrub communities found on steep south facing slopes (Bearberry/Juniper and Rose-Snowberry). These community types represented the transition from grassland to forest. The Bearberry/Juniper community type represents the transition from the grassland communities to the dry lodgepole pine, douglas fir and spruce forests. In contrast the Rose-Snowberry shrubland appears to represent the transition to moister deciduous and

Table 2. Grassland community types of the Montane subregion.

Community name	Community type	Productivity(kg/Ha)				Moisture	Drainage	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
A.	**Banff and Jasper Mountain ecodistricts**							
A1.	Fringed sage/Junegrass	-	-	-	250-750*	Subxeric	Rapidly	4-18
A2.	Northern wheatgrass-Sheep fescue	-	-	-	400*	Subxeric	Rapidly	4.0
A3.	Small leaved everlasting/Junegrass	-	-	-	250*	Xeric	Rapidly	18.0
A4.	Juniper/Northern wheatgrass-Columbia needlegrass	-	-	-	250*	Xeric	Rapidly	18.0
A5.	Little clubmoss/Richardson needlegrass	-	-	-	385*	Subxeric	Rapidly	2.4
A6.	Kentucky bluegrass-Junegrass/Dandelion	-	-	-	1500*	Submesic	Well	0.6
A7.	Bearberry/Juniper	-	-	-	500*	Subxeric	Well	Non-use
A8.	Rose-Snowberry	-	-	-	750*	Submesic	Well	3.0
A9.	Tufted hairgrass-Sedge	1208	98	0	1256	Subhygric	Mod. Well	1.1
A10.	Bog birch/Sedge-Rough fescue	592	198	12	802	Mesic	Well	1.7
A11.	Rough fescue-Fringed brome-Sedge	802	322	82	1207	Submesic	Well	1.1
A12.	Rough fescue-Sedge-Junegrass	584	228	69	881	Subxeric	Rapidly	1.5
A13.	Sedge-Junegrass	451	71	5	520	Submesic	Well	2.6
A14.	Creeping red fescue-Timothy	-	-	-	1500	Mesic	Well	0.9
B.	**Blairmore and Morley Foothills ecodistricts**							
B1.	Rough fescue-Idaho fescue-Parry oatgrass	1335	525	85	1908	Mesic	Well	0.5
B2.	Idaho fescue-Parry oatgrass-Rough fescue	1053	376	44	1467	Mesic	Well	0.6
B3.	Bluebunch wheatgrass-Sedge	759	493	245	1497	Subxeric	Rapidly	0.6
B4.	Rough fescue-Sedge/Bearberry	897	594	249	1740	Subxeric	Rapidly	0.5
B5.	Big sagebrush/B.wheatgrass-Sedge	-	-	-	500*	Subxeric	Rapidly	1.8
B6.	Snowberry-Rose-Saskatoon/Bearberry	725	419	161	1245	Subxeric	Rapidly	0.7
B7.	Pinegrass-Hairy wildrye/Strawberry	1487	1003	0	2260	Mesic	Well	0.4

Table 2. Grassland community types of the Montane subregion (continued).

Community name	Community type	Productivity(kg/Ha)				Moisture	Drainage	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total			
B8.	Douglas fir/Idaho fescue-Rough fescue	-	-	-	1750*	Submesic	Well	0.5
B9.	Douglas fir/Idaho fescue-Sandberg bluegrass	-	-	-	1750*	Submesic	Well	0.5
B10.	Aw/Strawberry/Rough fescue	1170	1206	0	2376	Hygric	Mod. Well	0.4
B11.	Thimbleberry	2190	25	186	2632	Subhygric	Mod. Well	0.7
B12.	Sedge meadow	-	-	-	1750*	Hydric	Imperfactly	0.5
B13.	Tufted hairgrass-Baltic rush	2238	239	170	2646	Hygric	Poorly	0.3
B14.	Forb meadows	824	146	292	1262	Subhygric	Well	0.7
B15.	Rough fescue-Hairy wildrye	1580	598	44	2222	Mesic	Well	0.4
B16.	Big sagebrush-Buckthorn/K. bluegrass	1000	500	400	1900*	Mesic	Well	0.6
C.	**Blairmore and Morley Foothills ecodistricts (disturbed grasslands)**							
C1.	Idaho fescue-Parry oatgrass-Sedge	1347	456	9	1812	Mesic	Well	0.5
C2.	Canada bluegrass-Rough fescue-Slender wheatgrass	1553	503	11	1621	Mesic	Well	0.5
C3.	Kentucky bluegrass-Rough fescue	1740	605	45	2371	Mesic	Well	0.4
C4.	Kentucky bluegrass-Timothy/Dandelion	1695	692	56	2442	Mesic	Well	0.4
C5.	Smooth brome-Kentucky bluegrass	1596	292	38	1925	Mesic	Well	0.5
C6.	Sedge/Little clubmoss-Moss phlox	460	355	67	881	Submesic	Rapidly	1.0
C7.	Creeping red fescue/Dandelion-Clover	1833	601	0	2434	Mesic	Well	0.4
C8.	Northern wheatgrass-Kentucky bluegrass	1112	642	82	1836	Submesic	Well	0.5
C9.	Rough fescue-Kentucky bluegrass	1159	472	31	1662	Mesic	Well	0.5
C10.	Rough fescue-Sedge-Brome	2185	136	0	2321	Mesic	Well	0.4
C11.	Snowberry-Kentucky bluegrass	-	-	-	2800*	Mesic	Well	0.4

*estimated production

spruce forests.

The grasslands in the Ya Ha Tinda area of the Banff and Jasper ecodistricts are transitional between the grasslands described in Banff and Jasper National Parks and the grasslands in the Morley and Blairmore Foothills ecodistricts of southern Alberta. Rough fescue is common in the Ya Ha Tinda which gives these grasslands some affinity to the rough fescue dominated grasslands in Southern Alberta. The predominance of junegrass and northern wheatgrass in the Ya Ha Tinda also gives these grasslands some affinity to the grasslands described near Banff and Jasper. The grasslands of the Ya Ha Tinda tend to be dry and well drained. They occur on south and west facing slopes and coarse textured fluvial areas. The dry slopes tend to have a predominance of rough fescue, sedge and junegrass. In contrast the level fluvial areas have a predominance of rough fescue and fringed brome. There are a number of community types in the Ya Ha Tinda that are transitional to the Upper Foothills and Subalpine subregions. These include the Tufted hairgrass-Sedge and Bog birch/Sedge-Rough fescue dominated community types.

Blairmore and Morley Foothills ecodistricts

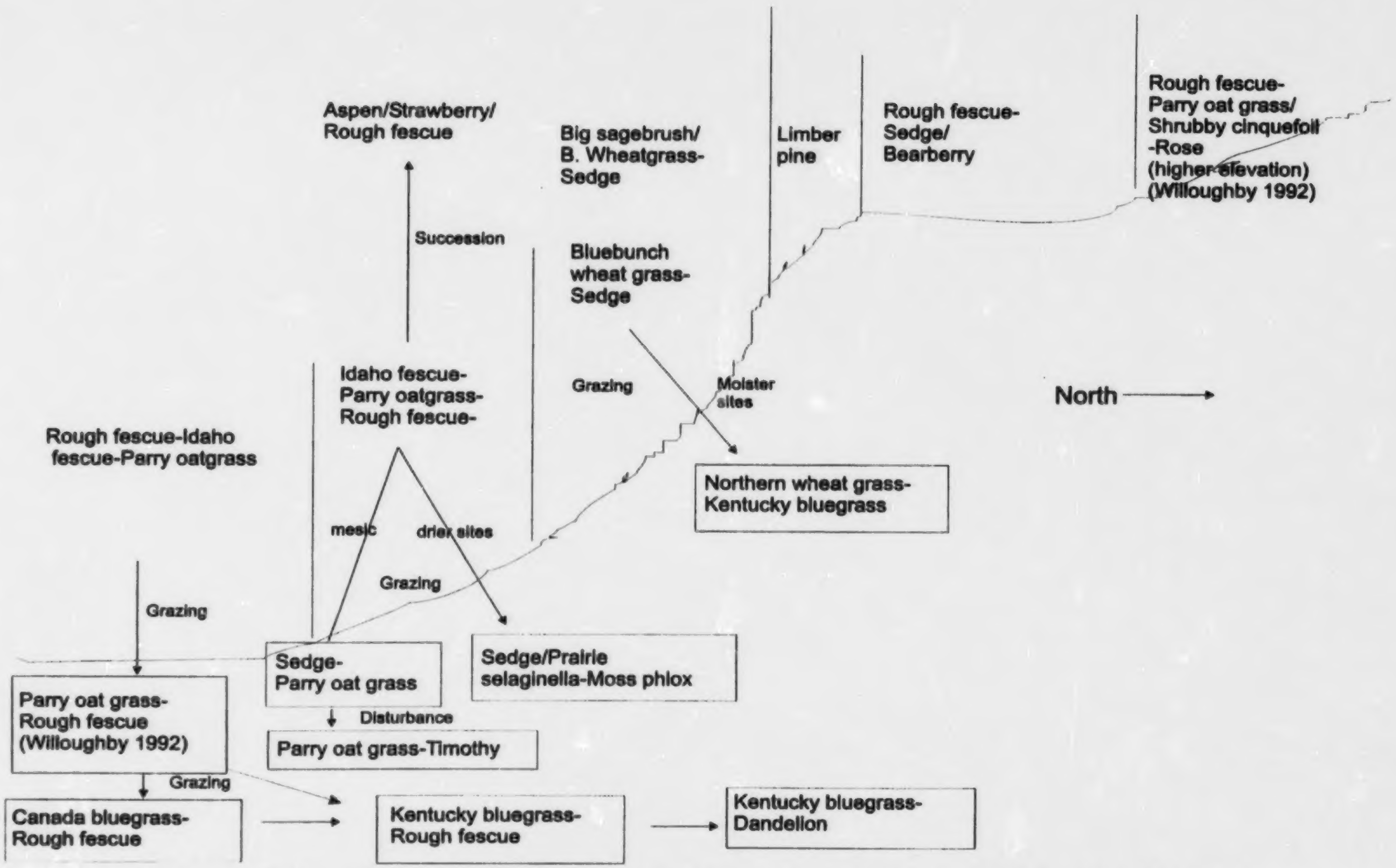
The dominant grassland community types of these ecodistricts near the Porcupine hills and south into the Castle area are outlined in Figures 1 and 2. The Rough fescue-Idaho fescue-Parry oatgrass dominates mesic to submesic, lower slope positions and terraces with Black Chernozemic soils. Situated upslope from this plant community on slightly drier sites with poorer soils, Parry oatgrass and Idaho fescue replace rough fescue as the dominant grass to form the Idaho fescue-Parry oatgrass-Rough fescue community type. The Bluebunch wheatgrass-Sedge community is found on steep south-facing slopes with Regosolic and Brunisolic soils. Further upslope on dry sandstone outcrops and xeric hillcrests, limber pine dominated community types are very common. A Rough fescue-Sedge/Bearberry-dominated community type is found on hilltops throughout the area. This type tends to be drier than the lower slope dominated rough fescue community type, but it is moister and not as rapidly drained as the Bluebunch wheatgrass-Sedge and limber pine dominated community types. Douglas fir invasion is common on these hilltop community types, to form the Douglas fir/Idaho fescue-Rough fescue and Douglas fir/Idaho fescue-Sandberg bluegrass community types. At higher elevations the ecotone between forest and grassland is dominated by the Snowberry-Rose-Saskatoon/Bearberry community type on drier sites and by the Pinegrass-Hairy wildrye community on moister sites with northerly aspects.

A Big sagebrush/Bluebunch wheatgrass-Sedge community type was described on a gravelly south facing slope south of Blairmore. This community type is rare in Alberta and appears to be an extension of the Palouse prairie from Eastern Washington (Moss 1947).

There are a number of community types that are characteristic of moist, poorly drained, nutrient rich sites. These include Thimbleberry brush, Sedge meadows, Tufted hairgrass-Baltic rush and Forb meadows. The Tufted hairgrass-Baltic rush community has plant species that are more characteristic of the Subalpine subregion (Willoughby and Smith 1997) and may represent the transition to the subalpine.

There are a number of different grassland community types that have been influenced by grazing pressure. Increased grazing pressure on a rough fescue dominated community type leads to a decline in rough fescue and an increase in Parry oatgrass and Idaho fescue to form the Idaho fescue-Parry oatgrass-Sedge community (Willoughby 1992). Continued heavy grazing pressure allows Kentucky or Canada bluegrass to establish to form the Kentucky bluegrass-Rough fescue or Canada bluegrass-Rough fescue community types. Continued heavy grazing pressure eventually leads to a decline in all native species and the site is dominated by Kentucky bluegrass and dandelion to form the Kentucky bluegrass\Dandelion community type. There are a number of community types that have been seeded to tame forage species through cultivation or reclamation. These include the Smooth brome-Kentucky bluegrass and Creeping red fescue/Dandelion-Clover community types.

On the drier slopes increased grazing pressure on the Idaho fescue-Parry oatgrass-Rough fescue and Bluebunch wheatgrass community types leads to an increase in low growing forbs and graminoids to form the Sedge/Little clubmoss-Moss phlox community type. On moister sites in these community types, grazing disturbance also leads to the formation of Parry oatgrass-Timothy and Northern wheatgrass-Kentucky bluegrass dominated community types.



Aspen/Strawberry/ Rough fescue
Succession
Big sagebrush/ B. Wheatgrass-Sedge
Limber pine
Rough fescue-Sedge/ Bearberry
Rough fescue-Parry oat grass/ Shrubby cinquefoil -Rose (higher elevation) (Willoughby 1992)
Bluebunch wheat grass-Sedge
Grazing
Moister sites
North
Idaho fescue-Parry oatgrass-Rough fescue-
Rough fescue-Idaho fescue-Parry oatgrass
Northern wheat grass-Kentucky bluegrass
mesic
drier sites
Grazing
Grazing
Sedge-Parry oat grass
Sedge/Prairie selaginella-Moss phlox
Parry oat grass-Rough fescue (Willoughby 1992)
Disturbance
Parry oat grass-Timothy
Grazing
Canada bluegrass-Rough fescue
Kentucky bluegrass-Rough fescue
Kentucky bluegrass-Dandelion

Figure 1. Ecology of the grassland community types in the Foothills ecodistricts of the Montane subregion

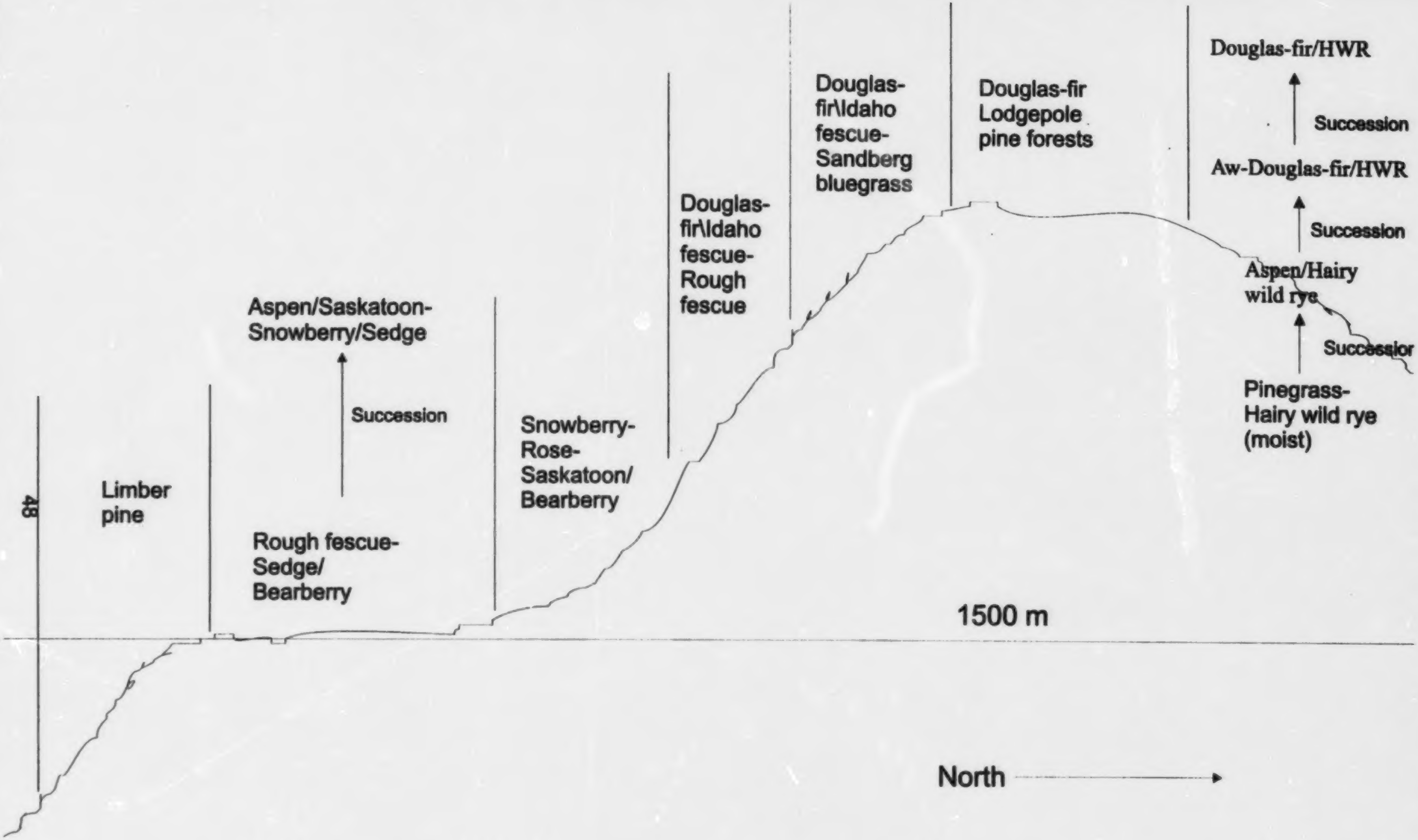
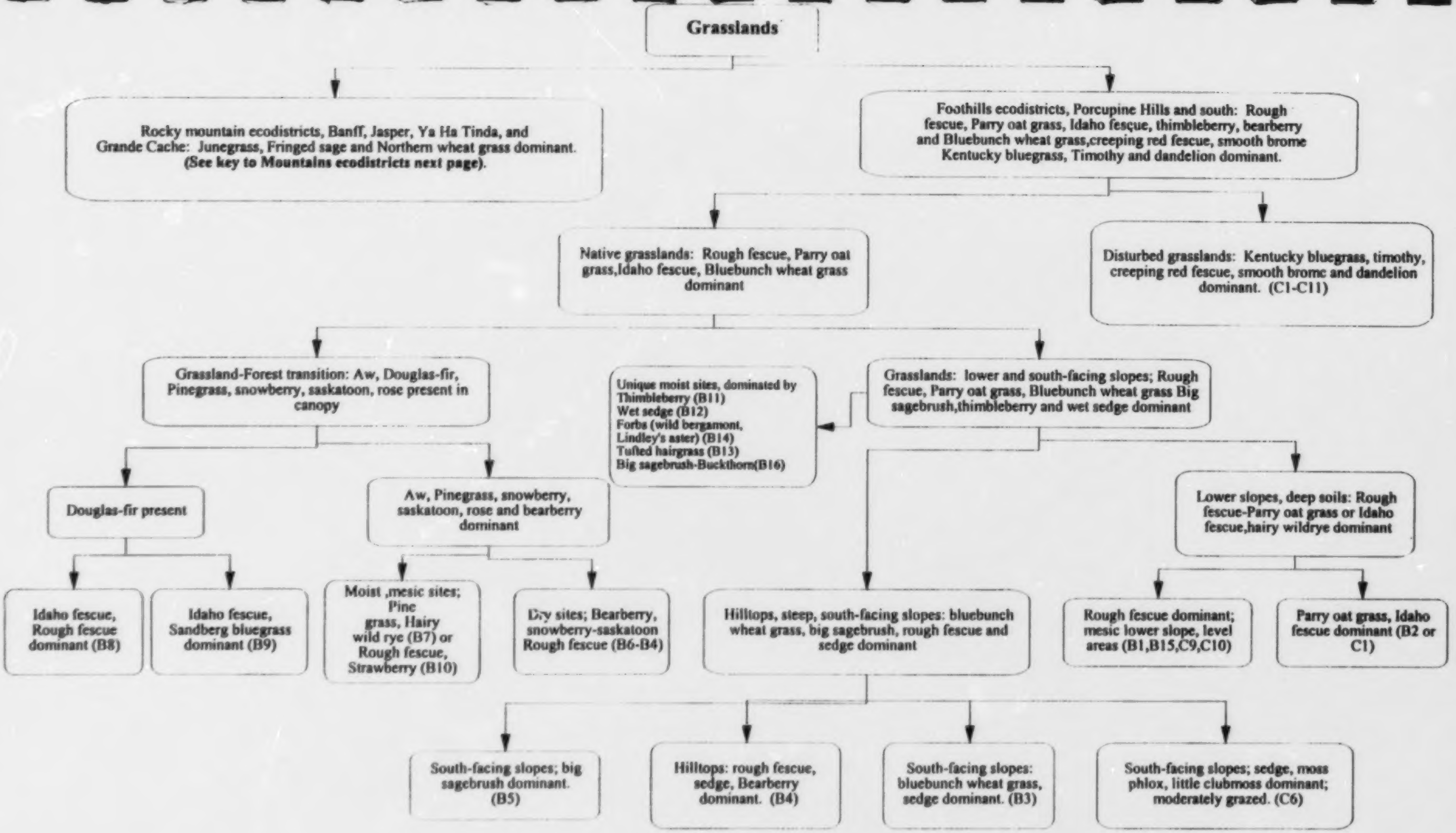
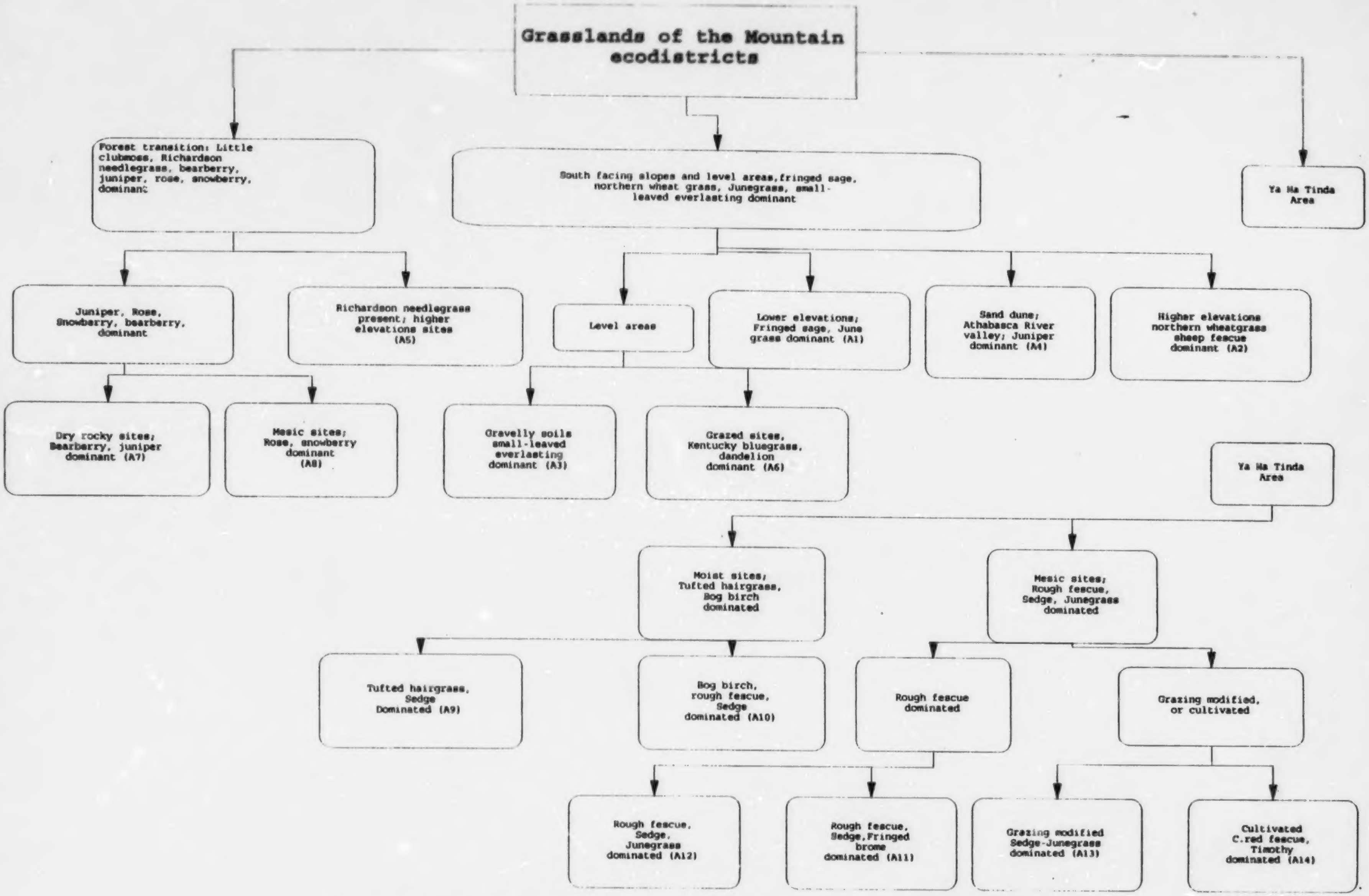

Limber pine
Aspen/Saskatoon-Snowberry/Sedge
Succession
Rough fescue-Sedge/Bearberry
Snowberry-Rose-Saskatoon/Bearberry
Douglas-fir\Idaho fescue-Rough fescue
Douglas-fir\Idaho fescue-Sandberg bluegrass
Douglas-fir Lodgepole pine forests
Douglas-fir/HWR
Succession
Aw-Douglas-fir/HWR
Succession
Aspen/Hairy wild rye
Succession
Pinegrass-Hairy wild rye (moist)
1500 m
North

Figure 2. Ecological Sequence of the Grassland-Forest Transition communities in the Montane subregion


Grasslands
Rocky mountain ecodistricts, Banff, Jasper, Ya Ha Tinda, and Grande Cache: Junegrass, Fringed sage and Northern wheat grass dominant. (See key to Mountains ecodistricts next page).
Foothills ecodistricts, Porcupine Hills and south: Rough fescue, Parry oat grass, Idaho fescue, thimbleberry, bearberry and Bluebunch wheat grass,creeping red fescue, smooth brome Kentucky bluegrass, Timothy and dandelion dominant.
Native grasslands: Rough fescue, Parry oat grass,Idaho fescue, Bluebunch wheat grass dominant
Disturbed grasslands: Kentucky bluegrass, timothy, creeping red fescue, smooth brome and dandelion dominant. (C1-C11)
Grassland-Forest transition: Aw, Douglas-fir, Pinegrass, snowberry, saskatoon, rose present in canopy
Unique moist sites, dominated by Thimbleberry (B11) Wet sedge (B12) Forbs (wild bergamont, Lindley's aster) (B14) Tufted hairgrass (B13) Big sagebrush-Buckthorn(B16)
Grasslands: lower and south-facing slopes; Rough fescue, Parry oat grass, Bluebunch wheat grass Big sagebrush,thimbleberry and wet sedge dominant
Douglas-fir present
Aw, Pinegrass, snowberry, saskatoon, rose and bearberry dominant
Lower slopes, deep soils: Rough fescue-Parry oat grass or Idaho fescue,hairy wildrye dominant
Idaho fescue, Rough fescue dominant (B8)
Idaho fescue, Sandberg bluegrass dominant (B9)
Moist ,mesic sites; Pine grass, Hairy wild rye (B7) or Rough fescue, Strawberry (B10)
Dry sites; Bearberry, snowberry-saskatoon Rough fescue (B6-B4)
Hilltops, steep, south-facing slopes: bluebunch wheat grass, big sagebrush, rough fescue and sedge dominant
Rough fescue dominant; mesic lower slope, level areas (B1,B15,C9,C10)
Parry oat grass, Idaho fescue dominant (B2 or C1)
South-facing slopes; big sagebrush dominant. (B5)
Hilltops: rough fescue, sedge, Bearberry dominant. (B4)
South-facing slopes: bluebunch wheat grass, sedge dominant. (B3)
South-facing slopes; sedge, moss phlox, little clubmoss dominant; moderately grazed. (C6)

Key to Grassland communities of the Montane Subregion


Grasslands of the Mountain ecodistricts
Forest transition: Little clubmoss, Richardson needlegrass, bearberry, juniper, rose, snowberry, dominant
South facing slopes and level areas, fringed sage, northern wheat grass, Junegrass, small-leaved everlasting dominant
Ya Ha Tinda Area
Juniper, Rose, Snowberry, bearberry, dominant
Richardson needlegrass present; higher elevations sites (A5)
Level areas
Lower elevations; Fringed sage, June grass dominant (A1)
Sand dune; Athabasca River valley; Juniper dominant (A4)
Higher elevations northern wheatgrass sheep fescue dominant (A2)
Dry rocky sites; Bearberry, juniper dominant (A7)
Mesic sites; Rose, snowberry dominant (A8)
Gravelly soils small-leaved everlasting dominant (A3)
Grazed sites, Kentucky bluegrass, dandelion dominant (A6)
Ya Ha Tinda Area
Moist sites; Tufted hairgrass, Bog birch dominated
Mesic sites; Rough fescue, Sedge, Junegrass dominated
Tufted hairgrass, Sedge Dominated (A9)
Bog birch, rough fescue, Sedge dominated (A10)
Rough fescue dominated
Grazing modified, or cultivated
Rough fescue, Sedge, Junegrass dominated (A12)
Rough fescue, Sedge, Fringed brome dominated (A11)
Grazing modified Sedge-Junegrass dominated (A13)
Cultivated C.red fescue, Timothy dominated (A14)

Key to Grassland community types in the Mountain Ecodistricts

MONTANE SUBREGION

BANFF AND JASPER MOUNTAIN ECODISTRICTS

GRASSLAND COMMUNITY TYPES

Photo 2: Banff and Jasper Mountain ecodistricts. This is a typical grassland of south-facing slopes in Jasper National Park. The high population of wild ungulates in the National Parks has resulted in heavy use on many of these grassland communities.

A1. Fringed sage/Junegrass

(Artemisia frigida/Koelera macrantha)

n=11 This community type is typical of steep south facing slopes, at lower elevations in the river valleys near Banff and Jasper. It is similar to the Junegrass-Plains reedgrass community described by Stringer (1973) near Banff and Jasper, the Purple reedgrass/Fringed sage community described by Bailey et al. (1992) in the Yukon and the Fringed sage/Slender wheatgrass community described by Pojar (1982) in Northern British Columbia. The prominent species of these grasslands (junegrass, northern wheatgrass, fringed sage, pussy toes and bearberry) are typical of xerophytic and Mixed Prairie type grasslands throughout Western Canada. The dessicating winds of the area and steep south- facing slopes would contribute to a climate that is similar to the Mixed Prairie subregion (Strong 1992). Grazing has also seemed to have had an influence on this community type. Stringer (1973) felt that with protection from heavy wildlife grazing Plains reedgrass and northern wheatgrass would increase and fringed sage and junegrass would decrease. Bailey et al. (1992), found that fringed sage, pussy toes, bearberry and low growing sedges increased and purple reedgrass declined with increased grazing pressure on the Purple reedgrass/Fringed sage community type. It would appear the dry climate, and heavy grazing pressure by wild ungulates have contributed to the development of this grassland community.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	2	0-10	36
GROUND JUNIPER			
(Juniperus communis)	2	0-10	36
FORBS			
FRINGED SAGE			
(Artemisia frigida)	11	0-40	91
BEARBERRY			
(Arctostaphylos uva-ursi)	2	0-10	27
WILD BLUE FLAX			
(Linum lewisii)	3	0-20	64
SMALL LEAVED EVERYLASTING			
(Antennaria parviflora)	4	0-30	27
GRASSES			
HAIRY WILDRYE			
(Elymus innovatus)	1	0-5	36
JUNEGRASS			
(Koelera macrantha)	16	0-40	100
PURPLE REEDGRASS			
(Calamagrostis purpurascens)	4	0-15	55
NORTHERN WHEATGRASS			
(Agropyron dasystachyum)	4	0-25	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1244(990-1720) M

SOIL DRAINAGE:
WELL TO RAPIDLY

SLOPE:
29(2-65)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION KG/HA

TOTAL 250-750 *ESTIMATE

SUGGESTED GRAZING CAPACITY
4-18 HA/AUM

A2. Northern wheatgrass-Sheep fescue

(Agropyron dasystachyum-Festuca saximontana)

n=5 This community type is similar to the Fringed sage/Junegrass community type. It occupies dry, steep, south facing slopes at slightly higher elevations than the Fringed sage/Junegrass community in the river valleys near Banff and Jasper. This community type appears to be in better range condition than the Fringed sage/Junegrass community type. As Stringer (1973) found, when the Fringed sage/Junegrass type was protected from grazing northern wheatgrass increased in cover. The higher elevation of these sites may restrict access to wild ungulate grazing. Consequently, it would appear this community type is not grazed as heavily as the Fringed sage/Junegrass community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	4	0-18	20
FORBS			
COMMON FIREWEED *(Epilobium angustifolium)*	1	0-2	60
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-3	40
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	0-10	20
YELLOW BEARDS TONGUE *(Penstemon confertus)*	1	0-5	60
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	5	0-25	40
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	34	10-60	100
SHEEP FESCUE *(Festuca sacimontana)*	2	0-1	40
JUNEGRASS *(Koeleria macrantha)*	1	0-2	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1561(1220-1859) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
34(5-65)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION KG/HA

TOTAL 400 *ESTIMATE

SUGGESTED GRAZING CAPACITY
4 HA/AUM

A3. Small-leaved everlasting/Junegrass

(Antennaria parviflora/Koeleria macrantha)

n=2 The two stands described in this community type are from dry, level areas in the Athabasca and North Saskatchewan river valleys near Jasper and Saskatchewan crossing. They are similar to the Fringed sage/Junegrass community type, but lack cover of fringed sage. Small leaved everlasting is known to be well adapted to xeric moisture conditions (Moss 1992) and is known to increase with increased grazing pressure (Stringer 1973, Bailey et al. 1992). Presently, it is not clear why fringed sage is absent from these sites.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL. *(Potentilla fruticosa)*	1	0-1	50
FORBS			
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	18	5-30	100
ALPINE MILK VETCH *(Astragalus alpinus)*	8	0-15	50
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-2	50
FRINGED SAGE *(Artemisia frigida)*	1	0-1	50
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	3	1-5	100
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	0-1	50
UPLAND SEDGE *(Carex spp.)*	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1160(1000-1380) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
1(0-2)%

ASPECT:
SOUTH TO WESTERLY

FORAGE PRODUCTION KG/HA

TOTAL 250 *ESTIMATE

SUGGESTED GRAZING CAPACITY
18 HA/AUM

A4. Juniper/Northern wheatgrass-Columbia needlegrass

(Juniperus horizontalis/Agropyron trachycaulum-Stipa columbiana)

n=2 This community type is distinguished from the other grassland community types in the Banff and Jasper river valleys by the presence of a high juniper cover. It occupies lower elevation, steep, xeric slopes with Regosolic and eolian soils. This community type often occurs in association with dense white spruce thickets which occur in mesic depressions between the sand dunes (Corns and Achuff 1982).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	1	1-1	100
CREEPING JUNIPER *(Juniperus horizontalis)*	16	2-30	100
GROUND JUNIPER *(Juniperus communis)*	4	0-8	50
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-5	50
ROSY EVERLASTING *(Antennaria rosa)*	8	0-15	50
ASCENDING PURPLE MILK VETCH *(Astragalus striatus)*	5	0-10	50
PRAIRIE GROUNDSEL *(Senecio canus)*	5	0-10	50
GAILLARDIA (BROWN-EYED SUSAN) *(Gaillardia aristata)*	3	0-6	50
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	3	0-5	50
COLUMBIA NEEDLEGRASS *(Stipa columbiana)*	8	0-15	50
SHEEP FESCUE *(Festuca saximontana)*	4	0-8	50
RUSH LIKE SEDGE *(Carex scirpoides)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1285(1050-1410) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
39(30-48)%

ASPECT:
SOUTH TO WEST

PARENT MATERIAL:
AEOLIAN

FORAGE PRODUCTION KG/HA

TOTAL 250 *ESTIMATE

SUGGESTED GRAZING CAPACITY
18 HA/AUM

A5. Little clubmoss/Richardson needlegrass

(Selaginella densa/Stipa richardsonii)

n=1 This community type is representative of small isolated, south facing slopes within the pine-spruce-fir forests. Stringer (1973), described a similar community at higher elevations near Banff and Jasper. Stringer felt this grassland was unrelated to any grasslands in Western North America and thus seemed to be a distinct grassland type characteristic of the moister sites in the Fescue prairies-coniferous forest ecotone of Banff and Jasper.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	15	-	100
SMALL- LEAVED EVERLASTING *(Antennaria parviflora)*	8	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	5	-	100
TUFTED FLEABANE *(Erigeron caespitosus)*	5	-	100
NODDING ONION *(Allium cernuum)*	2	-	100
SMALL FLOWERED BEARDTONGUE *(Penstemon procerus)*	2	-	100
GRASSES			
RICHARDSON NEEDLEGRASS *(Stipa richardsonii)*	8	-	100
PURPLE REEDGRASS *(Calamagrostis purpurascens)*	2	-	100
JUNEGRASS *(Koeleria macrantha)*	2	-	100
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	-	100
LICHEN	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1330 M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
15%

ASPECT:
SOUTHWEST

FORAGE PRODUCTION KG/HA

TOTAL 385 *ESTIMATE

SUGGESTED GRAZING CAPACITY
2.4 HA/AUM

A6. Kentucky bluegrass-Junegrass/Dandelion

(Poa pratensis-Koeleria macrantha/Taraxacum offincinle)

n=3 This community type was described on lower to level slope positions, with submesic to mesic moisture regimes. The presence of a high cover of Kentucky bluegrass is indicative of the heavy grazing influence on this community type. On mesic to subhygric sites in the fescue grasslands heavy grazing pressure is known to cause a decline in native grass species allowing Kentucky bluegrass to increase (Willoughby 1992). The presence of junegrass indicates that this community has some affinity with the Fringed sage/Junegrass community found in the same area. In the absence of grazing this community type may resemble a Rough fescue/Upland sedge community described on hill crests in the Porcupine hills (Willoughby 1992).

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-3	67
CREEPING JUNIPER *(Juniperus horizontalis)*	2	0-7	33
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-10	33
DANDELION *(Taraxacum offincinale)*	2	1-5	100
CUT LEAVED ANEMONE *(Anemone multifida)*	1	0-2	67
ASCENDING PURPLE MILK VETCH *(Astragalus striatus)*	5	0-15	33
LATE YELLOW LOCOWEED *(Oxytropis monticola)*	3	0-10	33
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	33	20-40	100
JUNEGRASS *(Koeleria macrantha)*	14	0-30	67
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	2	0-5	67
PARRY OATGRASS *(Danthonia parryii)*	2	0-5	67
COLUMBIA NEEDLEGRASS *(Stipa columbiana)*	5	0-15	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1328 (1110 - 1495) M

SOIL DRAINAGE:
WELL

SLOPE:
7(0-21)

ASPECT:
SOUTH

FORAGE PRODUCTION KG/HA

TOTAL 1500 *ESTIMATE

SUGGESTED STOCKING RATE
0.6 HA/AUM

A7. Bearberry/Juniper

(Arctostaphylos uva-ursi/Juniperus spp.)

n=17 This community type represents the forest-grassland ecotone on dry, rocky south facing slopes throughout the Banff and Jasper river valleys. Indeed many of the stands described in this community type were placed into douglas fir and spruce forest types described by Corns and Achuff (1982). Lane et al. (2000), described a similar community type Low northern sedge/Bearberry on rocky hilltops in the Lower Foothills subregion near Hinton.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	5	0-25	50
LODGEPOLE PINE *(Pinus contorta)*	2	0-11	44
SHRUBS			
JUNIPER *(Juniperus communis, J. horizontalis)*	8	0-35	94
BUFFALOBERRY *(Shepherdia canadensis)*	5	0-40	67
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	4	0-35	72
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	33	18-60	100
WHITE CAMAS *(Zigadenus elegans)*	3	0-20	39
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-10	17
GRASSES			
RUSH LIKE SEDGE *(Carex scirpoidea)*	3	0-20	22
HAIRY WILD RYE *(Elymus innovatus)*	3	0-15	72
JUNEGRASS *(Koeleria macrantha)*	1	0-3	39

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC TO SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1273(1000-1630) M

SOIL DRAINAGE:
WELL TO RAPIDLY

SLOPE:
28(0-68)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION KG/HA

TOTAL 500* *ESTIMATE

SUGGESTED GRAZING CAPACITY
NON-USE

A8. Rose-Snowberry

(Rosa acicularis-Symphoricarpos occidentalis)

n=6 This community type represents the forest-grassland ecotone on south facing slopes in both the Mountain and Foothills ecodistricts. This community type is moister and has better developed soils than the Bearberry/Juniper community type. This community type appears to be undergoing transition to a deciduous dominated forest. Many of the dominant understory species (rose, strawberry, northern bedstraw, tall lungwort and hairy wildrye) are all characteristic of deciduous stands (Willoughby and Downing 1995).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	0-2	33
BALSAM POPLAR *(Populus balsamifera)*	1	0-6	17
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	23	0-60	67
SNOWBERRY *(Symphoricarpos albus)*	22	10-87	100
BUFFALOBERRY *(Shepherdia canadensis)*	1	0-4	67
SASKATOON *(Amelanchier alnifolia)*	3	0-12	50
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	1	0-8	17
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-4	100
WILD STRAWBERRY *(Fragaria virginiana)*	12	1-52	100
TALL LUNGWORT *(Mertensia paniculata)*	1	0-4	33
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	50
WINTERGREEN *(Pyrola asarifolia)*	4	0-22	33
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	12	0-63	50
MARSH REEDGRASS *(Calamagrostis canadensis)*	3	0-86	17
TWO SEEDED SEDGE *(Carex disperma)*	3	0-18	17

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1308(1070-1539) M

SOIL DRAINAGE:
WELL

SLOPE:
26(0-65)%

ASPECT:
SOUTHWEST

FORAGE PRODUCTION KG/HA

TOTAL 750 *ESTIMATE

SUGGESTED GRAZING CAPACITY
3 HA /AUM

MONTANE SUBREGION

BANFF AND JASPER MOUNTAIN ECODISTRICTS

YA HA TINDA AREA

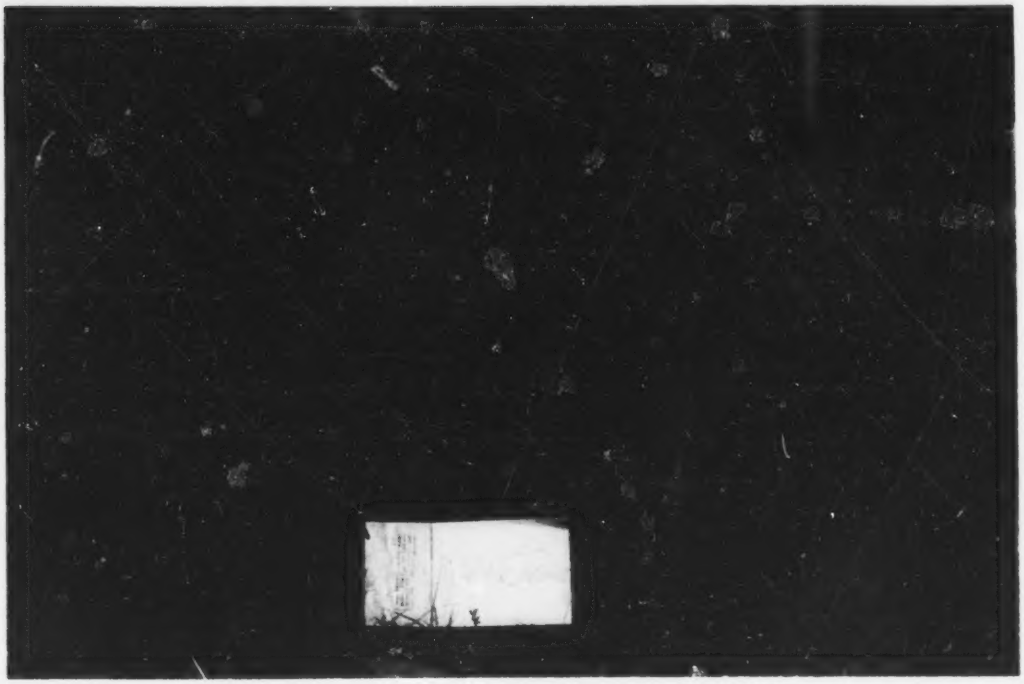


Photo 3: Banff and Jasper Mountain ecodistricts. This is a typical grassland of south-facing slopes and meadows in the Ya Ha Tinda. These grasslands are transitional between the grasslands described in Banff and Jasper National Parks and the Morley and Blairmore Foothills ecodistricts.

A9. Tufted hairgrass-Sedge

(Deschampsia cespitosa-Carex praegracilis)

n=1 This community type is located on moist sites that are better drained than pure sedge meadows. Willoughby (1992) and Willoughby and Smith (1997), found that tufted hairgrass is a common plant species on these lowland sites throughout the Upper Foothills and lower Subalpine subregions. The presence of this community type in the Ya Ha Tinda indicates that many of the grasslands in this area are transitional to the Upper Foothills and Subalpine subregions. Morgantini and Russell (1983), found that elk preferred the rough fescue dominated areas over these tufted hairgrass dominated communities at Ribbon flats just west of the Ya Ha Tinda. As a result this community type would be rated as secondary or non-use range for elk and horses in the Ya Ha Tinda area.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	-	100
FORBS			
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	8	-	100
YARROW *(Achillea millefolium)*	3	-	100
CHICKWEED *(Cerastium arvense)*	2	-	100
ELEPHANT'S HEAD *(Pedicularis groenlandica)*	2	-	100
GRASSES			
GRACEFUL SEDGE *(Carex praegracilis)*	39	-	100
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	12	-	100
SEDGE SPP. *(Carex spp.)*	9	-	100
HAIRY WILDRYE *(Elymus innovatus)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1640(1600-1700) M

SOIL DRAINAGE:
WELL

SLOPE:
9(1-20)%

ASPECT:
SOUTHWESTERLY

FORAGE PRODUCTION

GRASS	1208
FORB	98
TOTAL	1256

SUGGESTED GRAZING CAPACITY (HORSES)
1.1HA/AUM

A10. Bog birch/Sedge-Rough fescue

(Betula glandulosa/Carex spp.-Festuca scabrella)

n=1 This community type represents the invasion of bog birch onto the rough fescue grasslands. This community type is found scattered throughout the grasslands in the Ya Ha Tinda on slightly moister sites. It also appears to be transitional to many of the forested stands in the area. This community type is very similar to the Bog birch/Rough fescue community type described by Willoughby and Smith (1997) in the Upper Foothills subregion. They felt that the lack of fire on this community type allowed bog birch cover to expand, reducing forage productivity for wildlife and domestic livestock. In one study, burning bog birch twice in 3 year intervals controlled birch growth and increased total forage production by over 40% compared to the unburned control (Bork 1990).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BOG BIRCH *(Betula glandulosa)*	30	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	7	-	100
FORBS			
YARROW *(Achillea millefolium)*	3	-	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	2	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	4	-	100
HEART LEAVED ALEXANDERS *(Zizia aptera)*	4	-	100
OLD MAN'S WHISKERS *(Geum triflorum)*	3	-	100
AMERICAN VETCH *(Vicia americana)*	3	-	100
GRASSES			
SEDGE SPP. *(Carex spp.)*	12	-	100
ROUGH FESCUE *(Festuca scabrella)*	2	-	100
SHEEP FESCUE *(Festuca sacimontana)*	4	-	100
JUNEGRASS *(Koeleria macrantha)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1476 M

SOIL DRAINAGE:
WELL

FORAGE PRODUCTION KG/HA

GRASS	592
FORB	198
SHRUB	12
TOTAL	802

SUGGESTED GRAZING CAPACITY(HORSES)
1.7 HA/AUM

A11. Rough fescue-Fringed brome-Sedge

(Festuca scabrella-Bromus ciliatus-Carex spp.)

n=5 This community type represents coarse textured fluvial areas and moister south and west facing slopes. The increased moisture on these spots favours the growth of fringed brome. On the drier south and west facing slopes these grasslands are dominated by rough fescue, sedge and junegrass. The forage production on this community type tends to be slightly higher than the Rough fescue-Sedge-Junegrass dominated community type. Making this community type one of the most important foraging areas for wildlife. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely that rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL. *(Potentilla fruticosa)*	2	0-2	80
FORBS			
EARLY YELLOW LOCOWEED *(Oxytropis sericea)*	7	1-27	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	0-3	100
OLD MAN'S WHISKERS *(Geum triflorum)*	10	0-20	80
ALPINE HEDYSARUM *(Hedysarum alpinum)*	3	0-9	80
YARROW *(Achillea millefolium)*	3	0-8	60
SHOWY LOCOWEED *(Oxytropis splendens)*	2	0-6	60
CUT LEAVED ANEMONE *(Anemone multifida)*	2	0-3	60
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	3	1-6	100
FRINGED BROME *(Bromus ciliatus)*	10	2-17	100
THREAD-LEAVED SEDGE *(Carex filifolia)*	9	1-10	100
ROUGH FESCUE *(Festuca scabrella)*	8	4-11	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1640(1600-1700) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
6(0-20)%

ASPECT:
SOUTH TO WESTERLY

FORAGE PRODUCTION KG/HA

GRASS	802(560-1006)
FORB	322(130-674)
SHRUB	82(0-350)
TOTAL	1207(804-1740)

SUGGESTED GRAZING CAPACITY(HORSES)
1.1 HA/AUM

A12. Rough fescue-Sedge-Junegrass

(Festuca scabrella-Carex filifolia-Koeleria macrantha)

n=2 This community type is distinguished from the other rough fescue dominated community type by the lack of fringed brome and the increased cover of junegrass. This community type tends to occupy steeper, morainal and colluvial slopes and and has a drier moisture regime than the previously described rough fescue community type. Morgantini and Russell (1983) found that the rough fescue dominated community types were the primary foraging areas for elk. As a result this community type should be rated as primary range. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	3	1-4	100
FORBS			
EARLY YELLOW LOCOWEED			
(Oxytropis sericea)	10	7-12	100
WOOLY EVERLASTING			
(Antennaria lanata)	1	2-3	100
OLD MAN'S WHISKERS			
(Geum triflorum)	6	0-12	50
FALSE DANDELION			
(Agoseris glauca)	1	0-2	100
GRASSES			
NORTHERN WHEATGRASS			
(Agropyron dasystachyum)	3	2-3	100
JUNEGRASS			
(Koeleria macrantha)	7	3-10	100
ROUGH FESCUE			
(Festuca scabrella)	13	7-18	100
THREAD LEAF SEDGE			
(Carex filifoliaspp.)	5	5-5	100
HAIRY WILDRYE			
(Elymus innovatus)	2	0-4	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
MESOTROPHIC-SUBMESOTROPHIC

ELEVATION:
1625 (1600-1650) M

SOIL DRAINAGE:
RAPIDLY

SLOPE:
23(10-35)%

ASPECT:
SOUTH TO WEST

PARENT MATERIAL:
MORAINAL, COLLUVIAL

FORAGE PRODUCTION KG/HA

GRASS	584(514-654)
FORB	228(156-300)
SHRUB	69(24-114)
TOTAL	881(834-928)

SUGGESTED GRAZING CAPACITY(HORSES)
1.5 HA/AUM

A13. Sedge-Junegrass

(Carex filifolia-Koeleria macrantha)

n=2 This community type was described on the west side of the Ya Ha Tinda ranch. It is closer to the ranch buildings and therefore is more extensively utilized by horses. It was described on coarse textured fluvial areas. The parent material and ecological conditions are similar to the Rough fescue-Fringed brome-Sedge dominated community type. It appears that the heavier grazing pressure on this community type causes rough fescue to decline and allows sedge and junegrass to increase. The forage production on this community type is about half of the rough fescue dominated community types, indicating that some type of rest would benefit this grassland.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUB			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	8	5-9	100
FORBS			
EARLY YELLOW LOCOWEED *(Oxytropis sericera)*	2	0-3	100
THREE FLOWERED AVENS *(Geum trifolium)*	2	1-2	100
CUT LEAVED ANEMONE *(Anemone multifida)*	3	2-3	100
SHOWY LOCOWEED *(Oxytropis splendens)*	3	0-6	100
FRINGED SAGE *(Artemisia frigida)*	1	0-2	50
WHITE CAMAS *(Zigadenus elegans)*	1	0-2	50
GRASSES			
SEDGE SPP. *(Carex spp.)*	6	6-6	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	2-4	100
JUNEGRASS *(Koeleria macrantha)*	5	4-6	100
SHEEP FESCUE *(Festuc saximontana)*	3	1-4	100
LICHEN	7	1-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

ELEVATION:
1477(1474-1480) M

SOIL DRAINAGE:
RAPIDLY

FORAGE PRODUCTION KG/HA

GRASS	451 (90-884)
FORB	71(2-200)
SHRUB	5(2-10)
TOTAL	520(292-906)

SUGGESTED GRAZING CAPACITY(HORSES)
2.6 HA/AUM

A14. Creeping red fescue-Timothy

(Festuca rubra-Phleum pratense)

n=2 This community type represents spruce cutblocks that were harvested and seeded to creeping red fescue and timothy. This seeding was done in order to increase the forage supply for wintering elk and alleviate the pressure on the rough fescue dominated grasslands around the Ya Ha Tinda ranch. This seeding has increased the forage supply of the area, but it has been found that elk do not perfer to graze these sites. The agronomic species seeded into these cutblocks have also been found to be invasive (Gerling et al. 1996). Further range improvement should probably be done with a native seed mix.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW SPP. *(Salix spp.)*	2	0-2	100
FORBS			
TALL LARKSPUR *(Delphinium glaucum)*	1	0-2	50
FIREWEED *(Epilobium angustifolium)*	2	0	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-3	50
CREEPING RED FESCUE *(Festuca rubra)*	18	15-21	100
HAIRY WILDRYE *(Elymus innovatus)*	10	8-11	100
TIMOTHY *(Phleum pratense)*	8	7-9	100
SEDGE SPP. *(Carex spp.)*	6	1-11	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1593(1565-1620) M

SOIL DRAINAGE:
WELL TO IMPERFECTLY

SLOPE:
40(35-45)%

FORAGE PRODUCTION KG/HA

TOTAL 1500

SUGGESTED GRAZING CAPACITY(HORSES)
0.9 HA/AUM

MONTANE SUBREGION
BLAIRMORE AND MORLEY FOOTHILLS ECODISTRICTS
GRASSLAND COMMUNITY TYPES

Photo 4. Blairmore Foothills ecodistrict: This represents a Rough fescue-Sedge/Bearberry grassland found on a wind-swept, steep, south-facing slope where the moisture regime is submesic to subxeric. The harsh environmental conditions favour the growth of Limber pine.

Photo 5. Blairmore Foothills ecodistrict: This is a moderately-grazed Idaho fescue-Parry oatgrass-Rough fescue grassland. This community type is highly diverse as a result of light to moderate grazing. Under long-term, heavy grazing, diversity would decline as Kentucky bluegrass and dandelion became the dominant species.

B1. Rough fescue-Idaho fescue-Parry oatgrass

(Festuca scabrella-Festuca idahoensis-Danthonia parryii)

n=99 This community appears to be the modal grassland community type on Black Chernozemic soils in the foothills of southern Alberta from an elevation of 1300m up to 1900m on isolated sites. Willoughby (1992), described one Rough fescue-dominated site where the species composition had not changed in over 30 years, indicating this maybe the climax community type on river terraces and south facing slopes in the Montane. Indeed Moss and Campbell (1947), found that rough fescue grows almost to the exclusion of other plants in the absence of disturbance. On rocky and gravelly slopes with shallow soils, rough fescue is replaced by Parry oatgrass and Idaho fescue. They also found Parry oatgrass and Idaho fescue increased and rough fescue declined with increased grazing pressure. Willoughby (1992), also described rough fescue and Idaho fescue dominated community types with little Parry oatgrass in the Castle area south of Blairmore. He also found that rose and shrubby cinquefoil tended to increase in cover at higher elevations in these grasslands. In this guide it was difficult and impractical to distinguish these community types. Consequently, the Rough fescue, Rough fescue-Idaho fescue and Rough fescue-Parry oatgrass/Shrubby cinquefoil-Rose community types listed in Willoughby (1992) are grouped into this one large community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-25	59
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	4	0-24	62
YELLOW BEARDTONGUE *(Penstemon confertus)*	3	0-28	55
CUT LEAVED ANEMONE *(Anemone multifida)*	2	0-13	66
WOOLY GROMWELL *(Lithosperma ruderale)*	T	0-6	26
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	2	0-15	49
MOUNTAIN SHOOTING STAR *(Dodecatheon conjugens)*	1	0-21	56
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	29	0-61	100
IDAHO FESCUE *(Festuca idahoensis)*	9	0-48	91
PARRY OATGRASS *(Danthonia parryi)*	10	0-27	81
BLUNT SEDGE *(Carex obtusata)*	4	0-24	48

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1587(1370-2121) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE :
19(2-65)%

ASPECT:
SOUTHERLY-WESTERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1335(304-4144)
FORB	525(0-2378)
SHRUB	85(0-924)
TOTAL	1908(810-4838)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

B2. Idaho fescue-Parry oatgrass-Rough fescue

(Festuca idahoensis-Danthonia parryi-Festuca scabrella)

n=37 This community type is found upslope from the Rough fescue-Parry oatgrass-Idaho fescue community type (Figure 1) and can be dominated by Idaho fescue or Parry oatgrass. As one moves upslope to drier conditions there is a shift in species composition from rough fescue to Parry oatgrass and Idaho fescue. Under grazing pressure Parry oatgrass, Idaho fescue and rough fescue decline and upland sedge increases (Willoughby 1992). On drier sites within this community type juniper and bearberry cover can be extensive. Increased grazing pressure on the drier sites will lead to an increase in low growing forbs (little clubmoss, moss phlox) and sedges.

This particular community type has a stocking rate of 0.6 ha/AUM, based on 50% of the grass production.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-14	46
PRICKLY ROSE *(Rosa acicularis)*	2	0-15	49
FORBS			
YARROW *(Achillea millefolium)*	2	0-11	97
OLD MAN'S WHISKERS *(Geum triflorum)*	3	0-18	46
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	4	0-14	65
WOOLY GROMWELL *(Lithosperma ruderale)*	1	0-2	46
CUT LEAVED ANEMONE *(Anemone multifida)*	3	0-9	76
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	17	0-51	78
ROUGH FESCUE *(Festuca scabrella)*	10	0-30	94
IDAHO FESCUE *(Festuca idahoensis)*	17	0-63	94
BLUNT SEDGE *(Carex obtusata)*	3	0-22	30
JUNEGRASS *(Koeleria macrantha)*	3	0-18	84

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBXERIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION:
1531(1330-1848) M

SOIL DRAINAGE:
RAPIDLY-WELL

SLOPE:
21(0-36)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1053(242-2026)
FORB	372(10-838)
SHRUB	44(0-248)
TOTAL	1467(594-2446)

SUGGESTED GRAZING CAPACITY
0.6 HA/AUM

B3. Bluebunch wheatgrass-Sedge

(Agropyron spicatum-Carex obtusata)

n=26 Bluebunch wheatgrass dominated sites are found on well-drained, south facing-slopes in the Montane subregion throughout southern Alberta (Strong 1992). This dominant species is abundant in the interior of southern British Columbia, where it is codominant with big sagebrush (*Artemisia tridentata*) at lower elevations and rough fescue at higher elevations (Tisdale 1947). Increased grazing pressure on the drier sites leads to a decline in bluebunch wheatgrass and allows low growing forbs and sedge species to increase. On sites with big sagebrush in British Columbia bluebunch wheatgrass decreases and big sagebrush will increase with increased grazing pressure (Tisdale 1947). Forage production on this type can vary from 700 kg/ha on dry sites to over 1600 kg/ha on moister sites. One site that had been invaded by timothy produced over 5000 kg/ha (Bluebunch wheatgrass-Timothy community type).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	8	0-31	92
WESTERN SNOWBERRY *(Symphoricarpos occidentalis)*	8	0-41	65
FORBS			
YELLOW BEARDSTONGUE *(Penstemon confertus)*	1	0-24	46
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	4	0-28	65
COMMON STRAWBERRY *(Fragaria virginiana)*	2	0-17	35
BEARBERRY *(Arctostaphylos uva-ursi)*	5	0-21	39
FRINGED SAGE *(Artemisia frigida)*	3	0-12	50
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	9	0-22	92
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	1	0-17	39
BLUNT SEDGE *(Carex obtusata)*	3	0-21	27
BLUEBUNCH WHEATGRASS *(Agropyron spicatum)*	17	4-43	100
ROUGH FESCUE *(Festuca scabrella)*	5	0-29	73

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC-SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1635(1394-1848) M

SOIL DRAINAGE:
RAPIDLY TO VERY RAPIDLY

SLOPE:
43(0-65)%

ASPECT:
SOUTH TO WESTERLY

FORAGE PRODUCTION(KG\HA)

GRASS	759(396-1178)
FORB	493(0-1170)
SHRUB	245(0-626)
TOTAL	1497(612-2660)

SUGGESTED GRAZING CAPACITY
0.6 HA/AUM

B4. Rough fescue-Sedge/Bearberry

(Festuca scabrella-Carex obtusata/Arctostaphylos uva-ursi)

n=44 This community appears to be characteristic of dry grass meadows on hilltops throughout the Montane subregion. It is similar to the Rough fescue-Sedge community type described by Willoughby (1992) on hilltops in the Porcupine Hills. The shallow poorly developed soils appear to favour rough fescue, slender wheatgrass and sedge over Parry oatgrass. This community is drier than the Rough fescue grasslands characteristic of lower slope positions, but is moister than the bluebunch wheatgrass plant community that is associated with dry southerly slopes. This community type can be invaded by aspen to form the Aspen/Saskatoon/Sedge, Pl/Bearberry-Juniper or Fd/Hairy wildrye community types. The transition community between the forest and grassland may resemble the Pinegrass-Hairy wildrye or Snowberry-Rose-Saskatoon/Bearberry community types.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	0-14	46
CREEPING JUNIPER *(Juniprus horizontalis)*	2	0-24	23
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-6	32
SASKATOON *(Amelanchier alnifolia)*	3	0-16	66
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	29	0-77	84
FRINGED SAGE *(Artemisia frigida)*	1	0-5	11
MOSS PHLOX *(Phlox hoodii)*	1	0-8	14
CUT LEAVED ANEMONE *(Anemone multifida)*	3	0-21	89
STRAWBERRY *(Fragaria virginiana)*	3	0-19	71
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	23	5-54	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	0-34	43
JUNEGRASS *(Koeleria macrantha)*	2	0-14	80
BLUNT SEDGE *(Carex obtusata)*	4	0-21	46
IDAHO FESCUE *(Festuca idahoensis)*	5	0-18	77
PARRY OATGRASS *(Danthonia parryi)*	5	0-37	64

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1669(1341-2134)M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
28(7-58)%

ASPECT:
SOUTH TO WEST

FORAGE PRODUCTION(KG/HA)

GRASS	897(0-2184)
FORB	594(0-1684)
SHRUB	249(0-1192)
TOTAL	1740(236-3086)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

B5. Big sagebrush/Bluebunch wheatgrass-Sedge

(Artemisia tridentata/Agropyron spicatum-Carex spp.)

n=4 This community type is rare in Alberta and is isolated on gravelly south facing slopes in the Montane subregion south of Blairmore. This community type is similar to the Pacific Northwest Bunchgrass type described by Tisdale (1982) in Washington and British Columbia. The big sagebrush, bluebunch wheatgrass community types found in these areas are located on Dark Brown and Dk Gray Chernozemic soils, with glacial till parent material (Green and van Ryswyk 1982). Tisdale (1982), found that there is little known about the environmental factors which determine the presence of sagebrush-grass versus true grassland. Therefore, it is not clear why these south facing slopes are dominated by sagebrush and not a bluebunch wheatgrass community type. It is known that increased grazing pressure on a Big sagebrush/Bluebunch wheatgrass in British Columbia will allow big sagebrush to increase in cover, but heavy grazing pressure does not seem to be a factor in the formation of this community type in Alberta.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BIG SAGEBRUSH *(Artemisia tridentata)*	21	7-45	100
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	5	0-15	75
BEARBERRY *(Arctostaphylos uva-ursi)*	22	0-58	75
SMALL-LEAVED EVERLASTING *(Antennaria parviflora)*	1	1-2	100
NODDING ONION *(Allium cernuum)*	1	0-1	75
STICKY ALUMROOT *(Heuchera cylindrica)*	1	0-4	25
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	1-4	100
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	1	0-1	25
BLUEBUNCH WHEATGRASS *(Agropyron spicatum)*	5	2-13	75
IDAHO FESCUE *(Festuca idahoensis)*	8	6-13	75
JUNEGRASS *(Koeleria macrantha)*	3	2-4	75
BLUNT SEDGE *(Carex obtusata)*	1	0-1	25

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBXERIC-MESIC

NUTRIENT REGIME :
SUBMESOTROPHIC

ELEVATION:
1550(1470-1680) M

SOIL DRAINAGE :
RAPIDLY TO WELL

SLOPE:
39(35-40)%
ASPECT:
SOUTH AND WEST

FORAGE PRODUCTION (KG/HA)

TOTAL 500 *ESTIMATE

SUGGESTED GRAZING CAPACITY
1.8 HA/AUM

B6. Snowberry-Rose-Saskatoon/Bearberry

(Symphoricarpos occidentalis-Rosa acicularis-Amelanchier alnifolia/Arctostaphylos uva-ursi)

n=56 This community type represents the ecotone between rough fescue dominated grasslands and Douglas fir and lodgepole pine dominated forests on dry south facing slopes. The presence of shrubs (saskatoon, rose, snowberry) and the grass species (hairy wildrye, pinegrass) indicate the transition from rough fescue grasslands to a forested community type. This community type appears to occur at higher elevations (>1500m) and may reflect the dominance of trees at the higher altitudes. Forage production declines rapidly moving from the grassland into the forests. This community type has half the production (1100 kg/ha) of rough fescue dominated grasslands (2200 kg/ha). The increase in tree canopy cover results in a further decline in forage production to approximately 600 kg/ha.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	2	0-34	24
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	1	0-21	42
SNOWBERRY (*Symphoricarpos occidentalis*)	3	0-38	52
SASKATOON (*Amelanchier alnifolia*)	6	0-52	71
PRAIRIE ROSE , PRICKLY ROSE (*Rosa arkansana, R. acicularis*)	5	0-25	89
FORBS			
BEARBERRY (*Arctostaphylos uva-ursi*)	14	0-78	58
SILKY PERENNIAL LUPINE (*Lupinus sericeus*)	3	0-26	61
CUT LEAVED ANEMONE (*Anemone multifida*)	2	0-10	70
SMOOTH ASTER (*Aster laevis*)	2	0-17	47
STRAWBERRY (*Fragaria virginiana*)	4	0-28	58
GRASSES			
ROUGH FESCUE (*Festuca scabrella*)	6	0-25	75
JUNEGRASS (*Koeleria macrantha*)	5	0-17	82
BLUNT SEDGE (*Carex obtusata*)	5	0-61	38
HAIRY WILDRYE (*Elymus innovatus*)	2	0-44	29
PINEGRASS (*Calamagrostis rubescens*)	4	0-29	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
XERIC-SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

ELEVATION:
1601(1350-1981) M

SOIL DRAINAGE :
VERY RAPIDLY TO WELL

SLOPE (RANGE):
33(0-73)%

ASPECT:SOUTHERLY

FORAGE PRODUCTION (KG/HA)

GRASS	725(188-1594)
FORB	419(0-1086)
SHRUB	161(0-416)
TOTAL	1245(600-2706)

SUGGESTED GRAZING CAPACITY
0.7 HA/AUM

B7. Pinegrass-Hairy wildrye/Strawberry

(Calamagrostis rubescens-Elymus innovatus/Fragaria virginiana)

n=11 This community type represents the transition from grassland to forest on moist sites with northerly aspects. It appears this community occurs in areas that have some seepage throughout the growing season. There is usually high forb cover on these sites with strawberry, showy aster, american vetch, peavine and silky perennial lupine being common. Pinegrass and hairy wildrye are the common grass species in the understory of conifer and deciduous stands and their dominance in this community type may indicate a transition to a forested community. The high moisture content of these sites allows for production of over 2000 kg/ha

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	T	0-1	9
SHRUBS			
DWARF BILBERRY			
(Vaccinium caespitosum)	1	0-5	18
SNOWBERRY			
(Symphoricarpos occidentalis)	2	0-6	36
PRICKLY ROSE			
(Rosa acicularis)	2	0-5	46
WHITE MEADOWSWEET			
(Spiraea betulifolia)	2	0-10	55
FORBS			
STRAWBERRY			
(Fragaria virginiana)	13	1-32	100
YELLOW PEAVINE			
(Lathyrus ochroleucus)	4	0-13	91
SILKY PERENNIAL LUPINE			
(Lupinus sericeus)	5	0-20	55
SHOWY ASTER			
(Aster conspicuus)	5	0-20	73
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	23	3-66	100
HAIRY WILD RYE			
(Elymus innovatus)	7	0-48	36
NORTHERN AWNLESS BROME			
(Bromus pumpellianus)	1	0-3	9

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC-SUBHYGRIC

NUTRIENT REGIME :
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1514(1364-1640) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
25(2-46)%

ASPECT:
NORTHERLY, WEST, EAST

FORAGE PRODUCTION (KG/HA)

GRASS	1487(1058-1916)
FORB	1003(858-1148)
TOTAL	2260(1800-3064)

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

B8.Douglas fir/Idaho fescue-Rough fescue

(Pseudotsuga menziesii/Festuca idahoensis-Festuca scabrella)

n=3 This community type represents the transition from grassland to a Douglas fir dominated forest. The factors responsible for the differences between forest and grassland maybe climatic, with cooler and moister conditions favouring forest, it could be edaphic with grasslands found on drier and shallower soils or lack of disturbance from fire which favours the growth of trees. Extensive overlap of the forests and grassland will occur in the Montane because of the variable soils and topography.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	11	0-10	67
LODGEPOLE PINE *(Pinus contorta)*	1	0-1	67
SHRUBS			
SNOWBERRY *(Symphoricarpos albus)*	1	0-3	33
BUFFALOBERRY *(Shepherdia canadensis)*	1	0-2	33
WHITE MEADOWSWEET *(Spiraea betulifolia)*	7	0-15	67
FORBS			
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-2	100
WILD STRAWBERRY *(Fragaria virginiana)*	4	1-5	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	7	0-10	67
BALSAMROOT *(Balsamorhiza sagittata)*	1	0-2	67
GRASSES			
IDAHO FESCUE *(Festuca idahoensis)*	42	5-60	100
ROUGH FESCUE *(Festuca scabrella)*	33	20-60	100
PINEGRASS *(Calamagrostis rubescens)*	1	0-2	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1536 (1554-1680) M

SOIL DRAINAGE:
WELL

SLOPE:
14(0-30)%

ASPECT:
SOUTHWEST

FORAGE PRODUCTION(KG/HA)

TOTAL 1750 *ESTIMATE

SUGGESTED GRAZING CAPACITY
0.5 HA /AUM

B9.Douglas fir/Idaho fescue-Sandberg bluegrass

(Pseudotsuga menziesii/Festuca idahoensis-Poa sandbergii)

n=1 This community type is similar to the Douglas fir/Idaho fescue-Rough fescue community type and represents the transition from grassland to forest, but this type is drier and has shallower soils than the Douglas fir/Idaho fescue-Rough fescue community type. Little clubmoss, fringed sage, Sandberg bluegrass and junegrass are all well adapted to dry, rapidly drained sites. Johnston (1981), described a Sandberg bluegrass/Bluebunch wheatgrass type on dry sites with extremely shallow soils in Oregon and Tisdale (1982) described Sandberg bluegrass on dry sites with fine textured soils in British Columbia. It is also possible that increased grazing pressure may also account for the high cover of Sandberg bluegrass. Mueggler and Stewart (1980), found Sandberg bluegrass increased with grazing pressure on dry grasslands in Montana.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	5	-	100
SHRUBS			
CREEPING JUNIPER *(Juniperus communis)*	1	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	-	100
FORBS			
LITTLE CLUBMOSS *(Selaginella densa)*	5	-	100
DANDELION *(Taraxacum offincinale)*	3	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	2	-	100
BALSAMROOT *(Balsamorhiza sagitata)*	2	-	100
GRASSES			
IDAHO FESCUE *(Festuca idahoensis)*	30	-	100
SANDBERG BLUEGRASS *(Poa sandbergii)*	30	-	100
JUNEGRASS *(Koeleria macrantha)*	10	-	100
BLUEBUNCH WHEATGRASS *(Agropyron spicatum)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1493 M

SOIL DRAINAGE:
WELL

SLOPE:
33%

ASPECT:
SOUTHWEST

FORAGE PRODUCTION (KG/HA)

TOTAL 1750 *ESTIMATE

SUGGESTED GRAZING CAPACITY
0.5 HA /AUM

B10. Aw/Strawberry/Rough fescue

(Populus tremuloides/Fragaria virginiana/Festuca scabrella)

n=1 This community type represents the transition from a rough fescue dominated grassland to an aspen dominated forest. Aspen has invaded onto the grassland and the species composition of the understory is slowly succeeding to species characteristic of aspen stands such as strawberry and slender wheatgrass.

This community type is much moister than the Douglas fir transition forests previously described. Aspen favors the moist draws and north-facing slopes throughout the foothills of southern Alberta. As one moves west into the mountains and the Subalpine subregion, aspen tends to grow very poorly, and the aspen stands are characterized by stunted, twisted trees that have low vigour. Forage production on the grasslands declines rapidly when aspen invades; from a high of 2000 kg/ha to a low of 1000 kg/ha.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	5	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	17	-	100
DANDELION *(Taraxacum offincinale)*	1	-	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	5	-	100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	6	-	100
CANADA THISTLE *(Cirsium arvense)*	7	-	100
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	25	-	100
FOWL BLUEGRASS *(Poa palustris)*	41	-	100
GREEN NEEDLEGRASS *(Stipa viridula)*	12	-	100
RICHARDSON NEEDLEGRASS *(Stipa richardsonii)*	9	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
EUTROPHIC

ELEVATION:
1585 M

SOIL DRAINAGE:
MODERATELY WELL

SLOPE:
12

ASPECT:
SOUTH

FORAGE PRODUCTION (KG/HA)

GRASS	1170
FORB	1206
TOTAL	2376

SUGGESTED GRAZING CAPACITY
0.4 HA /AUM

B11. Thimbleberry

(Rubus parviflorus)

n=3 This community type is characteristic of nutrient-rich seepage areas throughout the Montane. This community is very similar to the Aw-Pb/Thimbleberry and Lodgepole pine/Thimbleberry community types described later in the guide, but it is not as successional advanced.

Forage production of this community type is very high because of the high moisture and nutrient content of the soil, but the thick cover of thimbleberry which is generally unpalatable to livestock at proper stocking levels limits access. As a result this community type would be rated as non-use range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	58	52-63	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	10	2-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	1-9	100
SHOWY ASTER *(Aster conspicuus)*	7	4-10	100
FIREWEED *(Epilobium angustifolium)*	4	3-4	100
BANEBERRY *(Actaea rubra)*	3	0-10	33
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	9	0-26	33
FOWL BLUEGRASS *(Poa palustris)*	1	1-2	100
FRINGED BROME *(Bromus ciliatus)*	1	0-1	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1640(1500-1860) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
35(10-50)%

ASPECT:
VARIABLE

FORAGE PRODUCTION (KG/HA)

GRASS	2190
FORB	256
SHRUB	186
TOTAL	2632

SUGGESTED GRAZING CAPACITY
0.7 HA/AUM

B12. Sedge meadows

(Carex rostrata, C. aquatilis)

n=3 This community type is found in all subregions of Alberta. Wet conditions and periodic flooding result in the formation of sedge meadows. Bog birch and willow will invade into the drier edges of these meadows to form the Willow/Sedge and Bog birch /Sedge community types.

These community types are quite productive producing nearly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992). As a result, these meadows would be rated as secondary or non-use range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW SPP. *(Salix spp.)*	1	1-2	100
FORBS			
PURPLE AVENS *(Geum rivale)*	5	0-16	33
SMOOTH ASTER *(Aster laevis)*	3	0-8	33
SWAMP HORSETAIL *(Equisetum fluviatile)*	4	0-11	33
FIREWEED *(Epilobium angustifolium)*	1	0-3	67
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	43	0-86	67
BALITIC RUSH *(Juncus baliticus)*	10	0-21	67
MARSH REEDGRASS *(Calamagrostis canadensis)*	6	0-17	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC-SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1485(1469-1500) M

SOIL DRAINAGE:
IMPERFECTLY, POORLY

SLOPE:
1%

ASPECT:
NORTHERLY

FORAGE PRODUCTION (KG/HA)

TOTAL 1750 *ESTIMATE

SUGGESTED GRAZING CAPACITY
0.5 HA /AUM

B13. Tufted hairgrass-Baltic rush

(Deschampsia cespitosa-Juncus baliticus

n=1 This community type is very similar to the tufted hairgrass-dominated communities described in the Upper foothills and Subalpine subregions of northern Alberta (Willoughby and Smith 1997) and may indicate the transition from the Montane to the Subalpine subregion in southern Alberta. This community is located on moist sites that are better drained and slightly drier than the pure sedge meadows. When this community is protected from grazing and fire for 25-40 years willow and bog birch expand and tufted hairgrass and sedge decline. The decline in graminoid cover causes a decline in available forage production.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	19	-	100
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	21	-	100
SMOOTH-LEAVED CINQUEFOIL *(Potentilla diversifolia)*	19	-	100
YELLOW BEARDSTONGUE *(Penstemon confertus)*	4	-	100
GRASSES			
TUFTED HAIRGRASS *(Deschampsia cespitosa)*	24	-	100
IDAHO FESCUE *(Festuca idahoensis)*	25	-	100
BALITIC RUSH *(Juncus baliticus)*	26	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION:
1509 M

SOIL DRAINAGE:
POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	2238
FORB	239
SHRUB	170
TOTAL	2646

SUGGESTED GRAZING CAPACITY
0.3 HA /AUM

B14. Forb meadows

(Aster ciliolatus, Monarda fistulosa,Smilacina stellata)

n=2 This community type represents small isolated forest openings that are dominated by forbs. The sites tend to be moist , moderately well drained and probably have some nutrient seepage at some time in the year. These meadows can be dominated by Lindley's aster, wild bergamont, snowberry, or star flowered solomon's seal. The grass layer is generally poorly developed which makes this community type hard to group with any of the grassland community types.

The forage production of this community type is generally quite high because of the higher moisture and nutrient content of the soil, but the areas are so small and isolated they contribute little to the overall carrying capacity of a disposition.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
FORBS			
STRAWBERRY			
(Fragaria virginiana)	5	1-8	100
STAR FLOWERED SOLOMON'S SEAL			
(Smilacina stellata)	6	0-12	50
WILD BERGAMONT			
(Monarda fistulosa)	15	0-30	50
LINDLEY'S ASTER			
(Aster ciliolatus)	15	0-29	50
YELLOW PEAVINE			
(Lathyrus ochroleucus)	3	0-6	50
YELLOW COLUMBINE			
(Aquilegia flavescens)	4	0-8	50
GRASSES			
ROUGH FESCUE			
(Festuca scabrella)	5	0-10	50
IDAHO FESCUE			
(Festuca idahoensis)	6	5-6	100
PARRY OATGRASS			
(Danthonia parryi)	5	0-9	50
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1565(1450-1680)M

SOIL DRAINAGE:
WELL

SLOPE:
22(2-40)%

FORAGE PRODUCTION (KG/HA)

GRASS	824
FORB	146
SHRUB	292
TOTAL	1262

SUGGESTED GRAZING CAPACITY
0.7 HA /AUM

B15. Rough fescue-Hairy wildrye

(Festuca scabrella-Elymus innovatus)

n=1 This community type was described on the east slopes of the Livingstone range and appears to represent a transitional community from the lower Montane subregion to the higher Subalpine region. Indeed Willoughby and Smith (1997) described a Rough fescue-Hairy wildrye community type in the southern subalpine. They felt that as one moved upslope there would be a shift in codominance of sedge to hairy wildrye and an increase in cover of bearberry and juniper. Corns and Achuff (1982), described hairy wildrye dominated community types on south facing slopes in the more northern ecodistricts of the subalpine. They felt these grasslands occurred on areas with frequent snow avalanching. It is possible that this community type is associated with deeper snow accumulation than the other rough fescue dominated types.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	13	-	100
PRICKLY ROSE *(Rosa acicularis)*	2	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	2	-	100
OLD MAN'S WHISKERS *(Geum triflorum)*	11	-	100
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	8	-	100
MOUNTAIN SHOOTING STAR *(Dodecatheon conjugens)*	4	-	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	1	-	100
HEART LV'D ALEXANDER *(Zizia aptera)*	2	-	100
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	20	-	100
IDAHO FESCUE *(Festuca idahoensis)*	7	-	100
PARRY OATGRASS *(Danthonia parryi)*	8	-	100
HAIRY WILDRYE *(Elymus innovatus)*	14	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1606 M

SOIL DRAINAGE:
WELL

SLOPE:
10%

ASPECT:
EAST

FORAGE PRODUCTION (KG/HA)

GRASS	1580
FORB	598
SHRUB	44
TOTAL	2222

SUGGESTED GRAZING CAPACITY
0.4 HA /AUM

B16. Big sagebrush-Buckthorn/Kentucky bluegrass

(Artemisia tridentata-Rhamnus alnifolia/Poa pratensis)

n=2 This community type was described on the valley bottoms and meadows adjacent to the South Castle river. Buckthorn tends to grow in the moist areas of the meadows which have fine textured soils. In contrast big sagebrush is found on the drier, gravelly soils of old creek beds. These meadows have been extensively utilized by livestock and recreationists which has allowed Kentucky bluegrass, timothy and dandelion to become established in the understory of these shrub species. It is difficult to determine what the understory vegetation was prior to disturbance. It is felt that this site was probably dominated by rough fescue, but the presence of dark scaled sedge and graceful sedge appear to indicate a higher moisture regime than rough fescue-dominated communities. The establishment of an exclosure to protect the site from disturbance may help to answer this question.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
BIG SAGEBRUSH			
(Artemisia tridentata)	19	17-21	100
SNOWBERRY			
(Symphoricarpos occidentalis)	17	16-18	100
BUCKTHORN			
(Rhamnus alnifolia)	7	5-8	100
FORBS			
STRAWBERRY			
(Fragaria virginiana)	6	5-7	100
YELLOW BEARDSTONGUE			
(Penstemon confertus)	29	28-30	100
YARROW			
(Achillea millefolium)	8	7-9	100
STAR FLW'D SOLOMON'S SEAL			
(Smilacina stellata)	3	2-3	100
DANDELION			
(Taraxacum officinale)	3	3	100
HEART LV'D ALEXANDER			
(Zizia aptera)	1	0-1	50
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	25	14-36	100
TIMOTHY			
(Phleum pratense)	9	9	100
DARK SCALED SEDGE			
(Carex atrosquama)	1	0-1	50
GRACEFUL SEDGE			
(Carex praegracilis)	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1440 M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
1%

ASPECT:
WEST

FORAGE PRODUCTION (KG/HA)

GRASS	1000
FORB	500
SHRUB	400
TOTAL	1900 *ESTIMATE

SUGGESTED GRAZING CAPACITY
0.6 HA /AUM *ESTIMATE

MONTANE SUBREGION

BLAIRMORE AND MORLEY FOOTHILLS ECODISTRICTS

DISTURBED GRASSLAND COMMUNITY TYPES

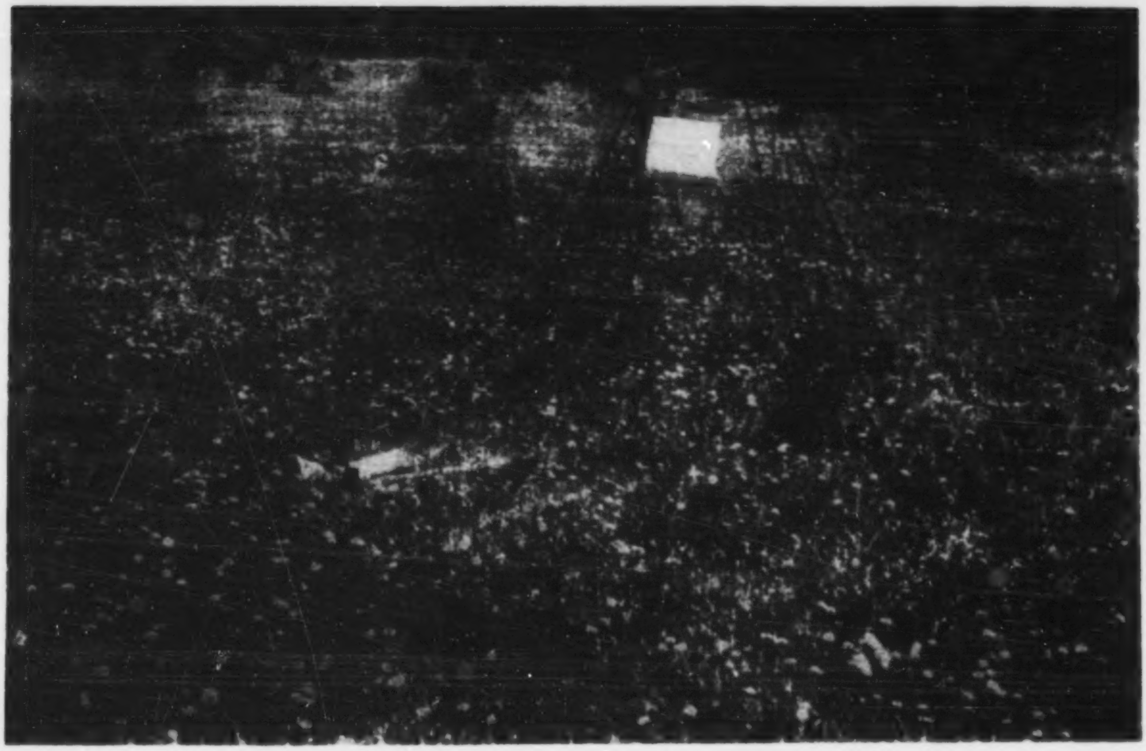


Photo 6: The dominance of Kentucky bluegrass, dandelion and clover indicate that this is an overgrazed grassland. Once Kentucky bluegrass has established dominance, the site will not return to the original vegetation composition when protected from grazing. Instead it will move to another community type, dominated by Kentucky bluegrass and native species such as rough fescue.

C1. Idaho fescue-Parry oatgrass-Sedge

(Festuca idahoensis-Danthonia parryi-Carex obtusata)

n=30 This community type represents a Rough fescue-Idaho fescue-Parry oatgrass plant community that has been moderately to heavily grazed for a number of years. The species composition of this community is very similar to the Idaho fescue-Parry oatgrass-Rough fescue community types , but this community type occupies lower slope positions, whereas the latter community occupies mid to upper slope positions.

Increased grazing pressure causes rough fescue to decline and allows Idaho fescue, Parry oatgrass and sedge species to increase. Continued heavy grazing pressure will eventually lead to a decline in all native species and Kentucky bluegrass and dandelion will dominate the site. If grazing pressure on this community type is reduced or is eliminated the type will likely succeed back to a rough fescue dominated grassland. However, if the present grazing pressure continues Kentucky bluegrass will likely dominate the site. Recovery of this grassland back to a rough fescue dominated community type will likely take 20-30 years (Willoughby 1996).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-12	37
FORBS			
THREE FLOWERED AVENS *(Geum triflorum)*	5	0-19	57
COMMON YARROW *(Achillea millefolium)*	3	0-9	93
DANDELION *(Taraxacum officinale)*	1	0-13	57
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-9	60
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-9	83
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	5	0-14	87
IDAHO FESCUE *(Festuca idahoensis)*	16	1-77	100
PARRY OATGRASS *(Danthonia parryi)*	10	0-63	63
BLUNT SEDGE *(Carex obtusata)*	3	0-49	10
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-24	77

ENVIRONMENTAL VARIABLE

MOISTURE REGIME:
SUBMESIC-MESIC

NUTRIENT REGIME
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION:
1495 (1330-1920) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
13(2-36)%

ASPECT:
SOUTH AND WEST

FORAGE PRODUCTION (KG/HA)

GRASS	1347(582-2796)
FORB	456(0-1230)
SHRUB	9(0-78)
TOTAL	1812(836-3134)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

C2. Canada bluegrass-Rough fescue-Slender wheatgrass

(Poa compressa-Festuca scabrella-Agropyron trachycaulum)

n=13 This community type was described on mesic, lower slope positions with shallow, nutrient poor soils. The presence of blunt sedge, junegrass and plains reedgrass are all indicative of dry, nutrient poor sites. The dominance of Canada bluegrass an introduced, occasional species that is adapted to grow on waste ground also appears to indicate that this community type is typical of nutrient poor soils. This community type appears to have also been moderately grazed. Increased grazing pressure causes rough fescue to decline and allows Canada bluegrass and dandelion to increase.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-20	54
FORBS			
OLD MAN'S WHISKERS *(Geum triflorum)*	3	0-7	77
COMMON YARROW *(Achillea millefolium)*	7	1-15	100
DANDELION *(Taraxacum officinale)*	9	0-24	92
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	3	0-13	77
NORTHERN BEDSTRAW *(Galium boreale)*	4	0-12	92
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	7	0-26	77
IDAHO FESCUE *(Festuca idahoensis)*	9	0-44	69
PARRY OATGRASS *(Danthonia parryi)*	2	0-13	31
BLUNT SEDGE *(Carex obtusata)*	6	0-19	62
CANADA BLUEGRASS *(Poa compressa)*	20	0-51	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-SUBHYGRIC

NUTRIENT REGIME
MESOTROPHIC

ELEVATION:
1480(1320-1631) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE:
14(0-30)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1553(5-3042)
FORB	503(0-878)
SHRUB	11(0-44)
TOTAL	1621(5-3692)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

C3. Kentucky bluegrass-Rough fescue

(Poa pratensis-Festuca scabrella)

n=63 Long-term heavy grazing pressure leads to decline in rough fescue and an increase in Parry oatgrass and sedge species. Continued grazing pressure reduces the competitive advantage of rough fescue and the other native grass species and allows Kentucky bluegrass to establish on the site. Continued heavy grazing pressure eventually leads to a decline in all native species and the plant community will resemble a Timothy-Kentucky bluegrass/ Dandelion type.

The shallow, nutrient poor soils of the Canada bluegrass dominated community type do not appear to favour the growth of Kentucky bluegrass under similar grazing conditions and may explain the lack of Kentucky bluegrass in the Canada bluegrass-Rough fescue-Slender wheatgrass community type..

The forage productivity of this community type (2600 kg/ha) is equivalent to or better than a lightly grazed Rough fescue-Parry oatgrass community (2015 kg/ha). However, rough fescue is a much more desirable forage species because it maintains its nutrient content into the dormant season. In contrast, Kentucky bluegrass loses its palatability, and nutrient content if it is allowed to flower and set seed.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-11	48
FORBS			
YARROW *(Achillea millefolium)*	6	0-41	92
OLD MAN'S WHISKERS *(Geum triflorum)*	5	0-41	60
DANDELION *(Taraxacum officinale)*	5	0-42	86
GRACEFUL CINQUEFOIL (*Potentilla gracilis*)	2	0-13	65
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	3	0-21	57
ROUGH FESCUE *(Festuca scabrella)*	7	0-30	75
IDAHO FESCUE (*Festuca idahoensis*)	6	0-39	78
BLUNT SEDGE (*Carex obtusata*)	2	0-18	37
KENTUCKY BLUEGRASS (*Poa pratensis*)	28	0-80	95

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION:
1486(1300-1768) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
17(5-55)%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1740(118-5028)
FORB	605(0-1720)
SHRUB	45(0-270)
TOTAL	2371(566-5886)

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

C4. Kentucky bluegrass-Timothy/Dandelion

(Poa pratensis-Phleum pratense/Taraxacum officinale)

n=72 This community type appears to once have represented a Rough fescue-Parry oatgrass-Idaho fescue community type on Black Chernozmic soils. Conitunued heavy grazing at the beginning of the century has shifted the community to one dominated by Kentucky bluegrass, timothy and dandelion.

The climax range condition model suggests that vegetation development will be directional, predictable and revert to the original vegetation when protected from grazing, but once Kentucky bluegrass has established, bluegrass appears to compete with rough fescue for codominance. When protected from grazing these Kentucky bluegrass dominated types move toward a different community type rather than back to the original vegetation. These sites closely follow the "State transition model" proposed by Westoby et al. (1989).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY			
(Symphoricarpos occidentalis)	1	0-18	10
FORBS			
GRACEFUL CINQUEFOIL			
(Potentilla gracilis)	4	0-45	64
DANDELION			
(Taraxacum officinale)	12	0-51	92
COMMON YARROW			
(Achillea millefolium)	6	0-45	93
MOUSE EARED CHICKWEED			
(Cerastium arvense)	1	0-22	51
STICKY PURPLE GERANIUM			
(Geranium viscosissimum)	2	0-15	46
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	34	0-92	97
TIMOTHY			
(Phleum pratense)	24	0-90	92
ROUGH FESCUE			
(Festuca scabrella)	1	0-12	26
IDAHO FESCUE			
(Festuca idahoensis)	1	0-23	25
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	1	0-17	44

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBMESIC

NUTRIENT REGIME:
PERMESOTROPHIC-MESOTROPHIC

ELEVATION:
1432(1350-1682) M

SOIL DRAINAGE:
WELL TO MODERATELY WELL

SLOPE:
5(0-36)%

ASPECT:
SOUTH TO WESTERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1695(244-3120)
FORB	692(0-4790)
SHRUB	56(0-640)
TOTAL	2442(284-5242)

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

C5. Smooth brome-Kentucky bluegrass

(Bromus inermis-Poa pratensis)

n=14 These sites probably were once rough fescue dominated. Cultivation and extreme grazing pressure have led to a decline in all native species. If these sites had been left undisturbed they would probably resemble a Rough fescue-Parry oatgrass-Idaho fescue community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CANADA THISTLE *(Cirsium arvense)*	3	0-14	57
COMMON YARROW *(Achillea millefolium)*	2	0-5	79
STRAWBERRY *(Fragaria virginiana)*	3	0-23	36
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	36	0-87	86
SMOOTH BROME *(Bromus inermis)*	40	2-78	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	1	0-9	50
TIMOTHY *(Phleum pratense)*	4	0-23	71

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-PERMESOTROPHIC

ELEVATION:
1498(1300-1768) M

SOIL DRAINAGE :
WELL

SLOPE:
11(0-60)%

ASPECT:
SOUTH TO WEST

FORAGE PRODUCTION (KG/HA)

GRASS	1596(900-2434)
FORB	292(148-528)
SHRUB	38(0-150)
TOTAL	1925(1300-2674)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

C6. Sedge/Little clubmoss-Moss phlox

(Carex obtusata/Selaginella densa-Phlox hoodii)

n=5 On dry, gravelly sites within the Parry oatgrass-Rough fescue and Bluebunch wheatgrass dominated community types increased grazing pressure causes Parry oatgrass, rough fescue and bluebunch wheatgrass to decline and allows low growing sedge and forb species to increase to form this community type. Indeed one of the sites (Stoddo) represents the outside transect of a rangeland reference area (Willoughby 1992). The inside transect which has been protected from grazing pressure belongs to the Idaho fescue-Parry oatgrass-Rough fescue community type.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	1	0-3	80
FORBS			
LITTLE CLUBMOSS			
(Selaginella densa)	24	0-42	80
SMALL LEAVED EVERLASTING			
(Antennaria parviflora)	3	0-12	60
NODDING ONION			
(Allium cernuum)	1	0-1	40
MOSS PHLOX			
(Phlox hoodii)	13	5-20	100
FRINGED SAGE			
(Artemisia frigida)	3	1-4	100
GRASSES			
BLUNT SEDGE			
(Carex obtusata)	12	7-20	100
JUNEGRASS			
(Koeleria macrantha)	7	2-13	100
ROUGH FESCUE			
(Festuca scabrella)	4	1-5	100
PARRY OATGRASS			
(Danthonia parryi)	11	0-17	80
NORTHERN WHEATGRASS			
(Agropyron dasystachyum)	4	0-14	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
SUBMESOTROPHIC TO MESIC

ELEVATION(RANGE):
1631 (1424-1787) M

SOIL DRAINAGE:
RAPIDLY TO WELL

SLOPE (RANGE):
12(0-26)%

ASPECT:
SOUTHWEST

FORAGE PRODUCTION (KG/HA)

GRASS	460(194-732)
FORB	355(182-742)
SHRUB	67(0-167)
TOTAL	881(476-1474)

SUGGESTED GRAZING CAPACITY
1.0 HA/AUM

C7. Creeping red fescue/Dandelion-Clover

(Festuca rubra/Taraxacum offincinale-Trifolium repens)

n=10 This community is an example of a rough fescue grassland which has been modified during reclamation of a natural gas pipeline and power transmission lines. Seed from the reclamation has influenced the plant association such that creeping red fescue and Kentucky bluegrass now dominate the site. Previously tame species like creeping red fescue were used in reclamation with little thought given to compatibility with surrounding native vegetation. It is now recognized that native species that promote the recovery of the original community structure and function should be used in reclamation (Gerling et al. 1996).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
DANDELION *(Taraxacum officinale)*	4	0-18	90
WHITE DUTCH CLOVER *(Trifolium repens)*	9	0-49	50
SWEET CLOVER *(Melilotus alba)*	1	0-11	10
ALFALFA *(Medicago sativa)*	3	0-26	10
COMMON YARROW *(Achillea millefolium)*	1	0-5	70
STRAWBERRY *(Fragaria virginiana)*	30	15	70
GRASSES			
TIMOTHY *(Phleum pratense)*	7	1-19	100
CREEPING RED FESCUE *(Festuca rubra)*	52	22-83	100
BLUNT SEDGE *(Carex obtusata)*	1	0-7	10
KENTUCKY BLUE GRASS *(Poa pratensis)*	8	0-27	90

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION(RANGE):
1503(1380-1615)M

SOIL DRAINAGE:
RAPIDLY TO MODERATELY WELL

SLOPE (RANGE):
8(4-10)%

ASPECT:
SOUTH

FORAGE PRODUCTION (KG/HA)

GRASS	1833(968-2600)
FORB	601(54-1044)
TOTAL	2434(2012-2654)

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

C8. Northern wheatgrass-Kentucky bluegrass

(Agropyron dasystachyum-Poa pratensis)

n=1 This community type is found on a dry, moderately to heavily grazed, south-facing slopes with shallow soils above the Oldman river in the Outer Gap range allotment. The moisture regime is not high enough to allow complete invasion of Kentucky bluegrass and dandelion . In the absence of disturbance the community type would probably resemble moister sites within the Bluebunch wheatgrass-Sedge community type.

The Outer Gap allotment is subject to extremely high, dessicating winds. As a result, the climate is very similar to the grasslands described in Rocky Foothills and Rocky Mountain ecodistricts. Indeed many of the species characteristic of the grasslands described in these ecodistricts (junegrass, northern wheatgrass, blunt sedge, small leaved everlasting) are found in this community type.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	12	-	100
PRAIRIE ROSE *(Rosa arkansana)*	7	-	100
FORBS			
DANDELION *(Taraxacum officinale)*	14	-	100
AMERICAN VETCH *(Vicia americana)*	13	-	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	10	-	100
SHOWY LOCOWEED *(Oxytropis splendens)*	8	-	100
LOW GOLDENROD *(Solidago missouriensis)*	6	-	100
GRASSES			
NORTHERN WHEATGRASS *(Agropyron dasystachyum)*	35	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	16	-	100
BLUNT SEDGE *(Carex obtusata)*	10	-	100
CANBY BLUEGRASS *(Poa canbyi)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1545 M

SOIL DRAINAGE:
WELL

SLOPE:
15%

ASPECT:
SOUTHERLY

FORAGE PRODUCTION KG/HA

GRASS	1112
FORB	642
SHRUB	82
TOTAL	1836

SUGGESTED GRAZING CAPACITY
0.5HA/AUM

C9. Rough fescue-Kentucky bluegrass

(Festuca scabrella-Poa pratensis)

n=25 This community type represents grasslands that have been grazed heavily to the point of Kentucky bluegrass invasion and are now recovering, or ungrazed exclosures that have been invaded by Kentucky bluegrass. Long-term heavy grazing pressure leads to a decline in rough fescue and an increase in Parry oatgrass and sedge species. Continued grazing pressure reduces the competitive advantage of rough fescue and the other native grass species and allows Kentucky bluegrass to establish on the site. Protection or a reduction in stocking level at the point where Kentucky bluegrass has become a significant component of the community allows rough fescue to recover, but it seems Kentucky bluegrass also remains as codominant. Willoughby (1996), found that some rangeland reference area sites which were protected from grazing before Kentucky bluegrass became established recovered to Rough fescue-Idaho fescue-Parry oatgrass in 20-30 years. In contrast sites that had significant Kentucky bluegrass invasion recovered to Rough fescue-Kentucky bluegrass dominated sites over the same time period. It appears that both the unidirectional climax range condition model proposed by Dysterhuis (Wroe et al. 1988) and the State and Threshold model proposed by Westoby et al. (1989) apply to the successional sequences of the rough fescue grasslands of southwestern Alberta. This makes it extremely difficult to assess range condition on these sites. That is why the Ecological site and Desired Plant community concepts proposed by the Task Group on Unity in Concepts and Terminology (1995) will likely have to be adopted to determine range condition on these rangelands.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-33	60
FORBS			
YARROW *(Achillea millefolium)*	4	0-16	88
OLD MAN'S WHISKERS *(Geum triflorum)*	8	0-30	76
DANDELION *(Taraxacum officinale)*	1	0-5	64
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-6	56
AMERICAN VETCH *(Vicia american)*	1	0-6	56
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	3	0-15	80
ROUGH FESCUE *(Festuca scabrella)*	21	9-44	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	11	0-41	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
ELEVATION(RANGE):
1506 (1330-1660) M
SOIL DRAINAGE:
WELL TO MODERATELY WELL
SLOPE (RANGE):
10(0-32)%
ASPECT:
SOUTHERLY

FORAGE PRODUCTION (KG/HA)

GRASS	1159(398-2246)
FORB	472(20-1116)
SHRUB	31(0-150)
TOTAL	1662(456-2742)

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

C10. Rough fescue-Sedge- Mountain brome

(Festuca scabrella-Carex obtusata-Bromus carinatus)

n=2 This community type represents grasslands that have been grazed moderately. Bromus carinatus is an introduced species that is well adapated to moist woods and dry open meadows. The two sites where this community were described were on lower slope positions.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
FORBS			
YARROW			
(Achillea millefolium)	1	1	100
OLD MAN'S WHISKERS			
(Geum triflorum)	3	1-5	100
DANDELION			
(Taraxacum officinale)	1	0-1	50
YELLOW BEARDSTONGUE			
(Penstemon confertus)	5	0-10	50
ALPINE BISTORT			
(Polygonum viviparum)	4	0-7	50
AMERICAN VETCH			
(Vicia americana)	3	0-6	50
GRASSES			
PARRY OATGRASS			
(Danthonia parryi)	1	0-1	50
ROUGH FESCUE			
(Festuca scabrella)	18	14-21	100
MOUNTAIN BROME			
(Bromus carinatus)	23	3-43	100
IDAHO FESCUE			
(Festuca idahoensis)	5	3-5	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC TO SUBMESIC

NUTRIENT REGIME:
PERMESOTROPHIC

ELEVATION(RANGE):
1540(1494-1585) M

SOIL DRAINAGE:
WELL TO RAPIDLY

SLOPE:
45%

ASPECT:
SOUTHEASTERLY

FORAGE PRODCUCTION (KG/HA)

GRASS	2185 (1170-3200)
FORB	136(60-212)
TOTAL	2321(1230-3412)

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

C11. Snowberry/Kentucky bluegrass
(Symphoricarpus occidentalis/Poa pratensis)

n=1 This community type was described on lower slope positions along the valley bottoms of the Porcupine Hills. The increased moisture content on these sites favours the growth of snowberry which has slowly invaded into the surrounding grasslands. Snowberry is common in the understory of many aspen communities throughout the Montane subregion. It is likely this community type will eventually become dominated by aspen.

The high moisture and nutrient content of the site make this a very productive community type, but the high snowberry cover limits its use by livestock. Snowberry is very resistant to fire and sprouts readily after burning. It has been found that mowing followed by herbicide treatment is effective in controlling snowberry growth.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	52	-	100
FORBS			
SILVER SAGE *(Artemisia ludoviciana)*	1	-	100
YARROW *(Achillea millefolium)*	1	-	100
AMERICAN VETCH *(Vicia americana)*	1	-	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	44	-	100
GREEN NEEDLE GRASS *(Stipa viridula)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
MESIC TO SUBHYGIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION:
1372M

SOIL DRAINAGE:
WELL

SLOPE:
10%

ASPECT:
SOUTHERLY

FORAGE PRODCUCTION (KG/HA)

TOTAL 2800*ESTIMATE

SUGGESTED GRAZING CAPACITY
0.4 HA/AUM

MONTANE SHRUBLAND ECOLOGY

Shrubland communities in the montane subregion of Alberta occur in valley bottoms, depressional areas, and on moist upland seepage areas. They are highly diverse and dynamic communities that represent transition from wetland to forest or seral stages of development following disturbance. The majority of the shrubland community types were described in the Banff and Jasper Mountain ecodistricts. Only the Willow/Beaked sedge-Marsh reedgrass and Bog birch-Basket willow-Myrtle lv'd willow communities were described in the Blairmore and Morley foothills ecodistricts.

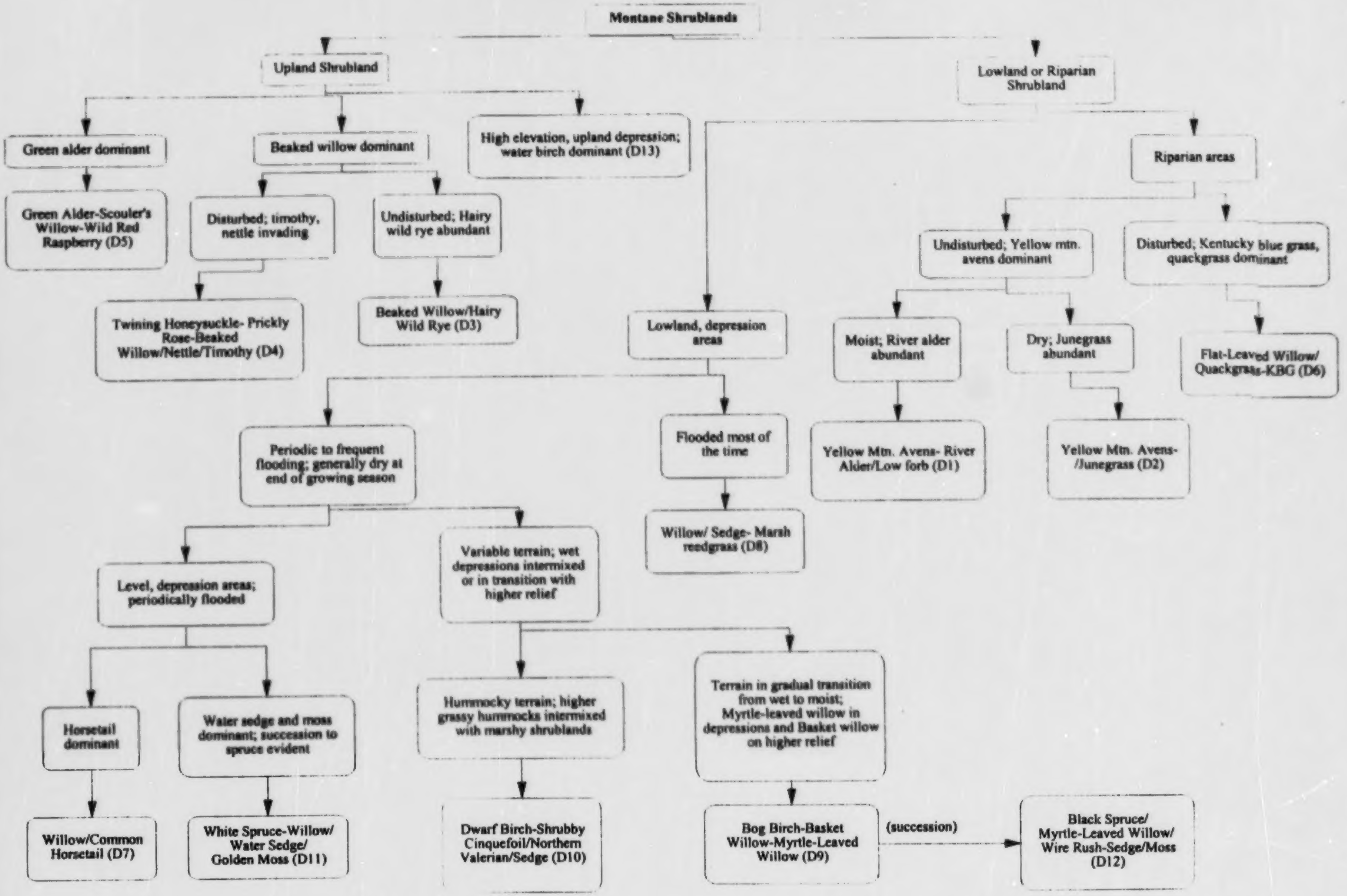
The Green alder-Scouler's willow-Wild red raspberry and Beaked willow/Hairy wild rye community types are found on moist, upland sites. They represent seral stages of development following disturbance. The Green alder-Scouler's willow-Wild red raspberry community type is found on moderate northerly slopes and the Beaked willow/Hairy wild rye community type is found on south-facing slopes with high moisture and nutrient regimes. These upland shrublands provide excellent forage for wildlife in the early stages of succession.

Lowland shrublands are found in low, marshy or bog sites and are often considered the edaphic climax communities on these sites since the wet cool soil conditions often prevent succession to forest. However, where organic matter begins to accumulate and the site becomes drier, succession to either black spruce or white spruce will occur. The extent of the shrub cover is highly dependent on the water level. Colonization by willow and other shrubs such as dwarf and bog birch begins on the drier edges of sedge meadows and streams. This colonization expands if the water level decreases, but declines under prolonged exposure to flooded conditions. The understory species most often associated with these shrublands include wire rush, beaked sedge, water sedge, other wetland sedges, and horsetail on the wettest sites. Bluejoint, slender wheatgrass, shrubby cinquefoil, and upland sedges are found on the more mesic, better drained sites. Where water sedge and/or golden moss are dominant in the understory (White spruce-Willow/Water sedge/Golden moss community type), this indicates a calcium-rich environment, often with stagnant water (Beckingham, 1994; MacKinnon et. al., 1992). A dominance of beaked sedge in the understory (Willow/Beaked sedge-Bluejoint and Bog birch-Basket willow-Myrtle-leaved willow community types), indicates nitrogen-rich conditions with flowing water (Beckingham, 1994). Bluejoint is a common understory species on the better-drained sites in these community types. It appears that tufted hair grass will replace bluejoint on similar sites as elevation increases (Lane et. al., 2000).

The shrublands found adjacent to riparian areas occur on well-drained, coarse-textured soils. Flat-leaved willow and river alder are almost strictly riparian species. Flat-leaved willow is found only on streamside silt and gravel bars or on low streambanks where the water table is shallow but the substrate drains well (Jaques and Corbin, 1981). River alder indicates a seepage area when found on a slope as in the Yellow mountain avens-River alder/Low forb community type. Elsewhere, it grows best on poorly-drained, lower slope positions. Yellow mountain avens is a common pioneer species on gravelly river bars and rocky slopes and grows especially well on calcium-rich soils (MacKinnon et. al., 1992). Silverberry is also common in these riparian areas. It prefers well-drained, coarse-textured soils such as in the Yellow mountain avens-Silverberry/Junegrass community type. The riparian shrublands described here will eventually succeed to white spruce in the absence of disturbance.

Table 3. Shrubland community types of the Montane subregion.

Community	Community type	Productivity (kg/ha) (*estimated) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying Capacity (ha/AUM)
D1.	Yellow mountain avens-River alder/ Low forb	0*	10*	200*	210*	Submesic	Well	non-use
D2.	Yellow mountain avens/ June grass	200*	10*	50*	260*	Mesic	Very Rapidly	non-use
D3.	Beaked willow/Hairy wild rye	1000*	200*	200*	1400*	Subhygric	Mod. Well	1.3
D4.	Twining honeysuckle-Prickly rose-Beaked willow/Nettle/Timothy	750*	250*	500*	1500*	Subhygric	Imperfectly	1.2
D5.	Green alder-Scouler's willow-Wild red raspberry	0*	10*	150*	160*	Mesic	Well	non-use
D6.	Flat-leaved willow/Quackgrass-Kentucky bluegrass	2000*	200*	300*	2500*	Subhygric	Mod. Well	0.7
D7.	Willow/Field horsetail	0*	300*	200*	500*	Hygric	Imperfectly	non-use
D8.	Willow/Sedge-Marsh reedgrass	872	224	446	1541	Subhydric	Very Poorly	non-use
D9.	Bog birch-Basket willow-Myrtle-leaved willow	1270	372	0	1642	Hygric	Mod. Well	1.1
D10.	Dwarf birch-Shrubby cinquefoil/ Northern valerian/Sedge	1500*	200*	300*	2000*	Hygric	Imperfectly	0.9
D11.	White spruce-Willow/Water sedge/ Golden moss	750*	100*	400*	1250*	Subhydric	Very Poorly	non-use
D12.	Black spruce/Myrtle-leaved willow/ Wire rush-Sedge/Moss	350*	50*	500*	900*	Subhydric	Poorly	non-use
D13.	Water birch-Smooth willow/Pinegrass				1800*	Hygric	Imperfectly	1.2


Montane Shrublands
Upland Shrubland
Lowland or Riparian Shrubland
Green alder dominant
Beaked willow dominant
High elevation, upland depression; water birch dominant (D13)
Riparian areas
Green Alder-Scouler's Willow-Wild Red Raspberry (D5)
Disturbed; timothy, nettle invading
Undisturbed; Hairy wild rye abundant
Undisturbed; Yellow mtn. avens dominant
Disturbed; Kentucky blue grass, quackgrass dominant
Twining Honeysuckle- Prickly Rose-Beaked Willow/Nettle/Timothy (D4)
Beaked Willow/Hairy Wild Rye (D3)
Lowland, depression areas
Moist; River alder abundant
Dry; Junegrass abundant
Flat-Leaved Willow/ Quackgrass-KBG (D6)
Periodic to frequent flooding; generally dry at end of growing season
Flooded most of the time
Yellow Mtn. Avens- River Alder/Low forb (D1)
Yellow Mtn. Avens- /Junegrass (D2)
Willow/ Sedge- Marsh reedgrass (D8)
Level, depression areas; periodically flooded
Variable terrain; wet depressions intermixed or in transition with higher relief
Horsetail dominant
Water sedge and moss dominant; succession to spruce evident
Hummocky terrain; higher grassy hummocks intermixed with marshy shrublands
Terrain in gradual transition from wet to moist; Myrtle-leaved willow in depressions and Basket willow on higher relief
Willow/Common Horsetail (D7)
White Spruce-Willow/ Water Sedge/ Golden Moss (D11)
Dwarf Birch-Shrubby Cinquefoil/Northern Valerian/Sedge (D10)
Bog Birch-Basket Willow-Myrtle-Leaved Willow (D9)
(succession)
Black Spruce/ Myrtle-Leaved Willow/ Wire Rush-Sedge/Moss (D12)

Key to the Montane Shrublands

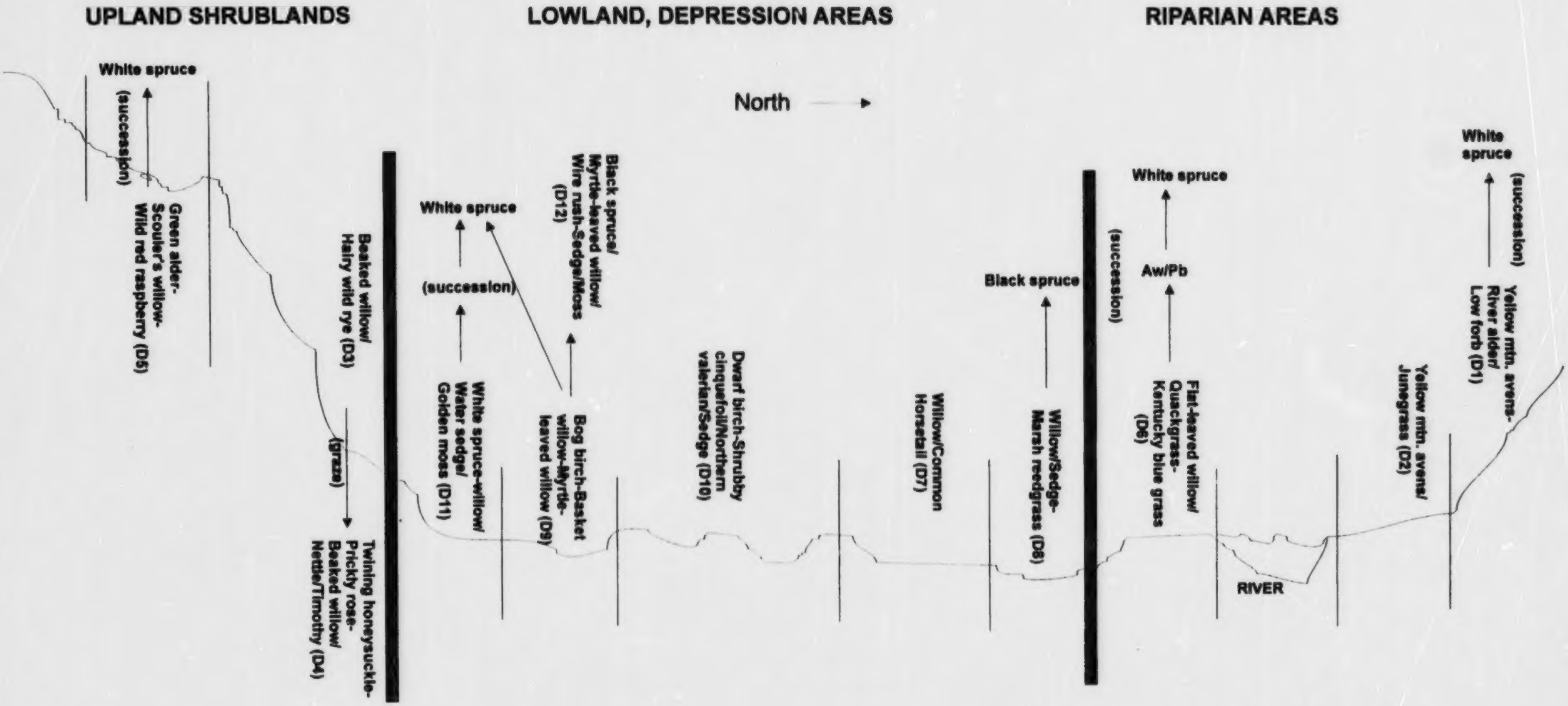

UPLAND SHRUBLANDS
LOWLAND, DEPRESSION AREAS
RIPARIAN AREAS
North
White spruce
(succession)
Green alder-
Scouler's willow-
Wild red raspberry (D5)
Beaked willow/
Hairy wild rye (D3)
(graze)
Twining honeysuckle-
Prickly rose-
Beaked willow/
Nettle/Timothy (D4)
White spruce
(succession)
White spruce-willow/
Water sedge/
Golden moss (D11)
Black spruce/
Myrtle-leaved willow/
Wire rush-Sedge/Moss
(D12)
Bog birch-Basket
willow-Myrtle-
leaved willow (D9)
Dwarf birch-Shrubby
cinquefoil/Northern
valerian/Sedge (D10)
Willow/Common
Horsetail (D7)
Black spruce
Willow/Sedge-
Marsh reedgrass (D8)
(succession)
White spruce
Aw/Pb
Flat-leaved willow/
Quackgrass-
Kentucky blue grass
(D6)
RIVER
Yellow mtn. avens/
Junegrass (D2)
White
spruce
(succession)
Yellow mtn. avens-
River alder/
Low forb (D1)

FIGURE 3: Landscape profile of montane shrubland community types

MONTANE SUBREGION

SHRUBLAND COMMUNITY TYPES

Photo 7: This photo represents a Basket willow-Bog birch/Sedge community type. These shrublands are found in valley depressions and are wet for much of the year. They provide excellent browse for wildlife.

D1. Yellow Mountain Avens-River Alder/ Low Forb

(Dryas drummondii-Alnus tenuifolia/Low forb)

n=1 This community type is found on an open, south-facing slope which supports a few scattered balsam poplar trees. The abundance of river alder and presence of balsam poplar indicates that this is a moist, nutrient-rich seep. In contrast yellow mountain avens grows favorably on open, well-drained sites and is typical of dry, gravelly river flats throughout Alberta. Willoughby and Smith (1997) described a Balsam poplar-White spruce/Willow/Yellow mtn. avens community type that is similar, but successionally more maturein the Upper Foothills subregion. In the absence of disturbance, river alder and balsam poplar will increase causing mountain avens to decrease as the site becomes shaded. Eventually this site will succeed to white spruce forest. This community type would be found upslope from the Yellow mtn. avens-Silverberry/Junegrass community type (D2) which is found on the level river flats.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	5	-	100
SHRUBS			
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	3	-	100
LODGEPOLE PINE SEEDLINGS *(Pinus contorta)*	1	-	100
RIVER ALDER *(Alnus tenuifolia)*	10	-	100
DWARF SHRUBS			
YELLOW MTN. AVENS *(Dryas drummondii)*	25	-	100
FORBS			
COMMON YARROW *(Achillea millefolium)*	1	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
DANDELION *(Taraxacum officinale)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
ELEVATION:
1210 M
ASPECT:
SOUTHWEST
SLOPE:
10%
SOIL DRAINAGE:
WELL

FORAGE PRODUCTION (KG/HA)

GRASS	0
FORBS	10
SHRUBS	200
TOTAL	210 *ESTIMATE

SUGGESTED GRAZING CAPACITY
NON-USE

D2: Yellow Mountain Avens/Junegrass
(Dryas drummondii/Koeleria macrantha)

n=2 This community type is typical of dry, gravelly river flats with nutrient poor soils. Mountain avens, silverberry, bearberry, juniper and junegrass are all characteristic of dry, rapidly-drained soils. Willoughby and Smith (1997) also describe a similar community type on dry, gravelly, well-drained river flats in the Upper Foothills Subregion. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community type should be rated as secondary or non-use range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	0-2	50
TREMBLING ASPEN *(Populus tremuloides)*	1	0-1	50
SHRUBS			
SILVERBERRY *(Elaeagnus commutata)*	5	0-10	50
CREEPING JUNIPER *(Juniperus horizontalis)*	1	0-1	50
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	1-3	100
DWARF SHRUBS			
YELLOW MTN. AVENS *(Dryas drummondii)*	35	23-47	100
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	2	0-4	50
FORBS			
COMMON YARROW *(Achillea millefolium)*	4	0-8	50
REFLEXED LOCO-WEED *(Oxytropis deflexa)*	3	0-5	50
CUT-LEAVED ANEMONE *(Anemone multifida)*	1	1	100
GRASSES			
JUNEGRASS *(Koeleria macrantha)*	21	1-40	100
AWNLESS BROME *(Bromus inermis)*	1	0-2	50
MARSH REED GRASS *(Calamagrostis canadensis)*	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-SUBXERIC

NUTRIENT REGIME: SUBMESOTROPHIC

ELEVATION: 1210-1848(1529) M

ASPECT: EAST

SLOPE: 1%

SOIL DRAINAGE: VERY RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	200
FORBS	10
SHRUBS	50
TOTAL	260*ESTIMATE

RECOMMENDED GRAZING CAPACITY
NON-USE

D3: Beaked Willow/Hairy Wild Rye

(Salix bebbiana/Elymus innovatus)

n=2 This community type represents a drier upland willow type which can be found on north-facing slopes, ravines and seepage areas. The moisture and nutrient regimes favor an abundance of willow and the presence of a few scattered spruce trees. Beaked willow is highly palatable to wild ungulates, therefore, this community should be considered important wildlife habitat. In the absence of disturbance, this community type will likely succeed to the climax white spruce forest.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	3	0-5	50
SHRUBS			
BEAKED WILLOW *(Salix bebbiana)*	8	0-15	50
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	8	1-15	100
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	4	3-5	100
WILLOW *(Salix spp.)*	4	2-5	100
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	1-10	100
COMMON YARROW *(Achillea millefolium)*	3	0-5	50
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-5	50
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-5	50
ALPINE HEDYSARUM *(Hedysarum alpinum)*	3	0-5	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	38	15-60	100
WIRE RUSH *(Juncus balticus)*	3	0-5	50
BLUEGRASS *(Poa spp.)*	3	0-5	50
TIMOTHY *(Phleum pratense)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(mean): 1000 - 1060 M (1030 M)

ASPECT: VARIABLE

SLOPE: 0-5%

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

:

GRASS	1000
FORBS	200
SHRUBS	200
TOTAL	1400*ESTIMATE

SUGGESTED GRAZING CAPACITY
1.3 HA/AUM

D4: Twining Honeysuckle-Prickly Rose-Beaked Willow/Nettle/Timothy

(Lonicera dioica-Rosa acicularis-Salix bebbiana/Urtica spp./Phleum pratense)

n=1 This community type is very similar to the Beaked willow/Hairy wild rye community type (D3), however, this community type has been altered by grazing. The dominant shrub species in this type are very similar to the understory of an aspen forest which would indicate that this community type is likely adjacent to an aspen forest. The area occupied within this community type is likely more open than the adjacent aspen forest which explains the heavy use by livestock. The grazing pressure has promoted the establishment of timothy as well as weeds such as nettle. Like the Beaked willow/Hairy wild rye community type, this type will likely succeed to white spruce in the absence of disturbance.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	-	100
SHRUBS			
TWINING HONEYSUCKLE *(Lonicera dioica)*	25	-	100
PRICKLY ROSE *(Rosa acicularis)*	15	-	100
BEAKED WILLOW *(Salix bebbiana)*	14	-	100
WILD RED RASPBERRY *(Rubus idaeus)*	10	-	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	2	-	100
FORBS			
NETTLE *(Urtica spp.)*	25	-	100
WILD VETCH *(Vicia americana)*	6	-	100
MICHAUX'S SAGE *(Artemisia michauxiana)*	3	-	100
COMMON YARROW *(Achillea millefolium)*	2	-	100
GRASSES			
TIMOTHY *(Phleum pratense)*	25	-	100
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 910 M

SOIL DRAINAGE: IMPERFECTLY

FORAGE PRODUCTION (KG/HA)

GRASS	750
FORBS	250
SHRUB	500
TOTAL	1500*ESTIMATE

SUGGESTED GRAZING CAPACITY
1.2 HA/AUM

D5: Green Alder-Scouler's Willow-Wild Red Raspberry

(Alnus crispa-Salix scouleriana-Rubus idaeus)

n=2 This community type is generally found on mesic to hygric lower subalpine sites on moderate northerly slopes. Soils are moderately well to well-drained on morainal landforms with the community occurring in seepage areas (Corns and Achuff, 1982). This type is similar to Jaques and Corbin's (1981) Scouler's willow-Beaked willow type. It is also comparable to the Willow-Alder-Low bush cranberry/Shield fern type described by Lane et al. (2000) in the Lower Foothills subregion on similar site types. *Salix scouleriana* dominates the overstory and alder makes up a major portion of the understory cover. Dominance of alder may indicate a recent fire or other disturbance in the understory since alder regenerates faster than *Salix scouleriana*. White spruce, aspen, balsam poplar and lodgepole pine can often be found to regenerate in this community type, therefore this community type will likely succeed to white spruce (Corns and Achuff, 1982).

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
SHRUBS			
GREEN ALDER *(Alnus crispa)*	43	5-80	100
SCOULER'S WILLOW *(Salix scouleriana)*	35	10-60	100
WILD RED RASPBERRY *(Rubus idaeus)*	21	1-40	100
PRICKLY ROSE *(Rosa acicularis)*	8	0-15	50
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	10	0-20	50
WESTERN CANADA VIOLET *(Viola canadensis)*	8	0-15	50
RED AND WHITE BANEBERRY *(Actaea rubra)*	5	0-10	50
BUNCHBERRY *(Cornus canadensis)*	3	0-5	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	3	1-5	100
MARSH REEDGRASS *(Calamagrostis canadensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION(MEAN): 1270-1580 M (1425 M)

ASPECT: NORTHERLY

SLOPE: 12-75%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	0
FORBS	10
SHRUBS	150
TOTAL	160*ESTIMATE

SUGGESTED GRAZING CAPACITY
NON-USE

D6: Flat-Leaved Willow/Quackgrass-Kentucky Bluegrass

(Salix planifolia/Agropyron repens-Poa spp.)

n=2 This community type represents a disturbed willow shrubland. *Salix planifolia* prefers areas where the water table is shallow, but the substrate drains well, therefore this community type is likely found adjacent to riparian areas on course-textured soils. Heavy grazing of this type has affected the understory vegetation allowing an increase in quackgrass and Kentucky bluegrass on the drier portions of this community type. The proximity to water and shallow water table would explain the heavy use by livestock as well as the high production. Care must be taken to ensure that the riparian habitat is not over-used by livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
FLAT-LEAVED WILLOW *(Salix planifolia)*	41	25-56	100
DWARF BIRCH *(Betula pumila)*	1	0-1	50
FORBS			
MARSH VIOLET *(Viola palustris)*	3	0-6	50
RUSH ASTER *(Aster borealis)*	2	0-3	50
GRASSES			
QUACKGRASS *(Agropyron repens)*	18	0-35	50
KENTUCKY BLUE GRASS *(Poa pratensis)*	18	0-35	50
BLUE GRASS *(Poa spp.)*	9	0-17	50
GREEN SEDGE *(Carex viridula)*	4	0-7	50
ALPINE RUSH *(Juncus alpinus)*	4	0-7	50
BEAKED SEDGE *(Carex rostrata)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO HYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION(MEAN): 990-1160 M (1075 M)

SOIL DRAINAGE: WELL TO POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	2000
FORBS	200
SHRUB	300
TOTAL	2500*ESTIMATE

SUGGESTED GRAZING CAPACITY
0.7 HA/AUM

D7: Willow/Field horsetail

(Salix spp./Equisetum arvense)

n=1 This is a highly unusual community type for the montane. It will likely only be found at the lower elevational limits of the montane subregion. Corns and Achuff (1982) describe this community type on hygric, level to gently sloping fluvial landforms of various aspects. The soils are imperfectly to poorly drained and are subject to periodic flooding and sediment deposition. Tree cover is absent and willow cover is high. Field horsetail is the dominant herb. Other species may also be found, such as dwarf shrubs and sedges, however, these are minor components.

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
Shrubs			
Willow *(Salix spp.)*	40	-	100
Red-osier dogwood *(Cornus stolonifera)*	1	-	100
Prickly rose *(Rosa acicularis)*	1	-	100
Forbs			
Field horsetail *(Equisetum arvense)*	40	-	100
Sweet-scented bedstraw *(Galium triflorum)*	1	-	100
Tall lungwort *(Mertensia paniculata)*	1	-	100
Common dandelion *(Taraxacum officinale)*	1	-	100

Environmental Variables

Moisture regime: Hygric

Nutrient regime: Permesotrophic

Elevation: 980 m

Soil drainage: Imperfectly

Forage Production (kg/ha)

Grass	0
Forbs	300
Shrub	200
Total	500*Estimate

Suggested Grazing Capacity
Non-Use

D8: Willow/Sedge-Marsh reedgrass

(Salix spp./Carex rostrata-Calamagrostis canadensis)

n=7 This community type is similar to the Willow-Bog birch/Sedge community type of Sundquist et al (1997). It represents a typical willow/sedge community type found on wet, poorly drained soils. There are numerous different species of willow as a result of the open canopy and the wet moisture regime. A high cover of beaked sedge indicates a nitrogen-rich environment where the water is moving. Tufted hair grass (*Deschampsia cespitosa*) will replace marsh reedgrass in this community type at higher elevations (Lane et al, 2000). This would be considered an edaphic climax community since the area is frequently flooded which prevents establishment of trees although it may be found in association with black spruce and black spruce-larch community types. This community type would be considered non-use for livestock due to the poor access caused by the wet substrate.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	18	0-86	57
BOG BIRCH *(Betula glandulosa)*	13	0-32	57
SHRUBBY WILLOW *(Salix arbusculoides)*	1	0-8	14
FORBS			
ARROW-LEAVED COLTSFOOT *(Petasites saggitatus)*	3	0-18	14
LARGE-LEAVED AVENS *(Geum macrophyllum)*	2	0-13	14
LINDLEYS ASTER *(Aster ciliolatus)*	5	0-13	71
STRAWBERRY (*Fragaria virginiana*)	3	0-12	43
GRASSES			
SEDGE *(Carex rostrata, C. aquatilis)*	12	0-60	29
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	0-22	29
WIRE RUSH *(Juncus balticus)*	7	0-18	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYDRIC-HYGRIC

NUTRIENT REGIME : MESOTROPHIC- PERMESOTROPHIC

ELEVATION(MEAN): 1322-1524(1470) M

SOIL DRAINAGE: IMPERFECTLY- VERY POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	872(422-1800)
FORBS	224(24-700)
SHRUB	446(294-710)
TOTAL	1541(740-3000)

SUGGESTED GRAZING CAPACITY
NON-USE

D9: Bog Birch-Basket Willow-Myrtle-Leaved Willow

(Betula glandulosa-Salix petiolaris-Salix myrtillifolia)

n=5 This community type represents an ecotone from subhydric to mesic. *Salix myrtillifolia* represents the wetter, cooler end of the ecotone where the soils are poorly drained, and *Salix petiolaris* represents the slightly drier portion of the ecotone where the soils are well to moderately-well drained. None of the dominant shrubs in this community type are palatable to wild ungulates, however the understory shrubs and forbs could provide a substantial amount of forage depending on the moisture regime and the extent of shrub cover. In the more open grassy areas associated with *Salix petiolaris*, *Deschampsia cespitosa* (tufted hair grass) can be found along with *Calamagrostis canadensis* (marsh reedgrass) and upland sedges. In the *Salix myrtillifolia* association, wetland sedges dominate. These areas would most likely be considered non-use due to the wet substrate. This community type (specifically the *Salix myrtillifolia* association) will most likely succeed to the Black spruce/Myrtle-leaved willow/Wire rush-Sedge/Moss community type (D12).

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
BOG BIRCH			
(*Betula glandulosa*)	11	0-23	80
BASKET WILLOW			
(Salix petiolaris)	26	0-68	60
MYRTLE-LEAVED WILLOW			
(Salix myrtillifolia)	9	0-28	40
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	2	0-9	60
HOARY WILLOW			
(Salix candida)	5	0-23	40
SMOOTH WILLOW			
(Salix glauca)	4	0-17	20
FORBS			
VEINY MEADOW RUE			
(Thalictrum venulosum)	3	0-8	80
FIREWEED			
(Epilobium angustifolium)	2	0-2	80
PURPLE AVENS			
(Geum rivale)	2	0-5	60
SMOOTH ASTER			
(Aster laevis)	3	0-16	20
GRASSES			
WIRE RUSH			
(Juncus balticus)	5	1-10	100
BEAKED SEDGE			
(Carex rostrata)	5	0-12	60
GRACEFUL SEDGE			
(Carex praegracilis)	3	0-8	60
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	2	0-7	60
MELIC GRASS			
(Melica smithii)	2	0-11	20
CREEPING RED FESCUE			
(Festuca rubra)	1	0-5	20
MARSH REEDGRASS			
(Calamagrostis canadensis)	1	0-6	20
TUFTED HAIR GRASS			
(Deschampsia cespitosa)	1	0-1	20

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYDRIC
NUTRIENT REGIME : MESOTROPHIC TO PERMESOTROPHIC
ELEVATION: 1440 M
SLOPE: 0-6%
ASPECT: NORTHERLY
SOIL DRAINAGE: WELL TO POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	1270
FORBS	372
SHRUB	0
TOTAL	1642

SUGGESTED GRAZING CAPACITY
1.1 HA/AUM

D10: Dwarf Birch-Shrubby Cinquefoil/Northern Valerian/Sedge

(Betula pumila-Potentilla fruticosa/Valeriana dioica/Carex spp.)

n=2 This community type occurs on hummocky terrain. On wet, marshy sites, *Betula pumila, Salix glauca, Salix maccalliana* and *Carex aquatilis* are found. On the drier, subhygric hummocks, grassy open areas are dominated by *Potentilla fruticosa, Deschampsia cespitosa,* and *Elymus innovatus*. The drier hummocks would be the only areas useful for domestic livestock,but may be difficult to access if the low areas are flooded. Therefore, this community type should be considered secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
DWARF BIRCH *(Betula pumila)*	23	20-25	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	18	15-20	100
SMOOTH WILLOW *(Salix glauca)*	13	10-15	100
VELVET-FRUITED WILLOW *(Salix maccalliana)*	15	0-30	50
FORBS			
NORTHERN VALERIAN *(Valeriana dioica)*	5	2-8	100
SHOWY EVERLASTING *(Antennaria pulcherrima)*	1	1	100
FIREWEED *(Epilobium angustifolium)*	1	1	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	1	100
ELEPHANT'S HEAD *(Pedicularis groenlandica)*	3	0-5	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	2	100
SEDGE *(Carex spp.)*	20	0-40	50
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	13	0-25	50
RUSH-LIKE SEDGE *(Carex scirpoidea)*	8	0-15	50
WATER SEDGE *(Carex aquatilis)*	4	0-8	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(MEAN): 1390-1440 M (1415 M)

SOIL DRAINAGE: IMPERFECTLY TO POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	1500
FORBS	200
SHRUB	300
TOTAL	2000*ESTIMATE

SUGGESTED GRAZING CAPACITY
0.9 HA/AUM

D11: White Spruce-Willow/Water Sedge/Golden Moss

(Picea glauca-Salix spp./Carex aquatilis/Tomenthypnum nitens)

n=2 This community type represents a wet willow shrubland succeeding to white spruce. The high water sedge and golden moss cover indicates a calcium-rich environment (Beckingham, 1994; MacKinnon et al., 1992). As organic matter accumulates and the site becomes drier, willow and spruce will increase in cover. This community would be considered non-use for domestic livestock, however, *Salix arbusculoides* and *Salix bebbiana* are very palatable to wild ungulates, therefore, this type would be considered important wildlife habitat.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
WHITE SPRUCE SEEDLINGS *(Picea glauca)*	2	1-4	100
SHRUBBY WILLOW *(Salix arbusculoides)*	18	0-35	50
DWARF BIRCH *(Betula pumila)*	4	0-8	50
BEAKED WILLOW *(Salix bebbiana)*	4	0-8	50
COMMON LABRADOR TEA *(Ledum groenlandicum)*	2	0-3	50
LODGEPOLE PINE SEEDLINGS *(Pinus contorta)*	1	0-2	50
FORBS			
RUSH ASTER *(Aster borealis)*	1	1	100
WILD STRAWBERRY *(Fragaria virginiana)*	1	1	100
SWAMP HORSETAIL *(Equisetum fluviatile)*	10	0-20	50
DEWBERRY *(Rubus pubescens)*	1	0-2	50
GRASSES			
WATER SEDGE *(Carex aquatilis)*	29	20-38	100
BEAKED SEDGE *(Carex rostrata)*	3	0-5	50
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	0-1	50
MOSSES			
GOLDEN MOSS *(Tomenthypnum nitens)*	42	18-65	100
RUSTY PEAT MOSS *(Sphagnum fuscum)*	8	0-15	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: EUTROPHIC

ELEVATION: 1240 M

ASPECT: VARIABLE

SLOPE: 0-2 %

SOIL DRAINAGE: VERY POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	750
FORBS	100
SHRUB	400
TOTAL	1250*ESTIMATE

SUGGESTED GRAZING CAPACITY
NON-USE

D12: Black Spruce/Myrtle-Leaved Willow/Wire Rush-Sedge/Moss

(Picea mariana/Salix myrtillifolia/Juncus balticus-Carex spp./ Moss spp.)

n=3 This community type represents a wet willow shrubland succeeding to black spruce. It is most simlar to the Bog birch-Basket willow-Myrtle-leaved willow community type (D9), however this one is successionally more advanced. *Salix myrtillifolia* is characteristic of mossy bogs, muskegs and moist conifer forests (Jaques and Corbin, 1981). This would be considered non-use for domestic livestock and wildlife because *Salix myrtillifolia* is generally unpalatable.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	7	0-10	67
SHRUBS			
BLACK SPRUCE SEEDLINGS *(Picea mariana)*	15	1-40	100
LABRADOR TEA *(Ledum groenlandicum)*	3	1-5	100
MYRTLE-LEAVED WILLOW *(Salix myrtillifolia)*	25	0-50	67
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	4	0-10	67
DWARF BIRCH *(Betula pumila)*	3	0-5	67
PRICKLY ROSE *(Rose acicularis)*	2	0-5	67
FORBS			
DWARF SCOURING RUSH *(Equisetum scirpoides)*	2	0-5	67
NORTHERN BED STRAW *(Galium boreale)*	1	0-2	67
GRASSES			
WIRE RUSH *(Juncus balticus)*	14	1-30	100
SHEATHED SEDGE *(Carex vaginata)*	15	0-40	67
HAIR-LIKE SEDGE *(Carex capillaris)*	2	0-3	67
NEBRASKA SEDGE *(Carex nebraskensis)*	5	0-15	33
MOSSES			
GOLDEN MOSS *(Tomenthypnum nitens)*	10	0-30	67
TUFTED MOSS *(Aulacomnium palustre)*	4	0-10	67
BROWN MOSS *(Drepanocladus revolvens)*	7	0-20	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION(MEAN): 1290-1300 M (1295 M)

SOIL DRAINAGE: POORLY

FORAGE PRODUCTION (KG/HA)

GRASS	350
FORBS	50
SHRUB	500
TOTAL	900*ESTIMATE

SUGGESTED GRAZING CAPACITY
NON-USE

D13: Water birch-Smooth willow/Pinegrass

(Betula occidentale-Salix glauca/Calamagrostis rubescens)

n=1 This community was described on a hilltop depression which supports a high moisture and nutrient regime. The depression also provides protection from the prevailing winds. Therefore, shrubs are abundant, however, due to wet conditions at the bottom of the depression, trees will likely only develop on the drier edges. The surrounding wind-exposed areas support grassland vegetation, therefore, this community type would provide good shelter for livestock later in the fall when the site had dried.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicer involcrata)*	6	-	100
WATER BIRCH *(Betula occidentale)*	21	-	100
SMOOTH WILLOW *(Salix glauca)*	21	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	15	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus.)*	10	-	100
STRAWBERRY *(Fragaria virginiana)*	8	-	100
WINTERGREEN *(Pyrola asarifolia)*	7	-	100
SMOOTH ASTER *(Aster laevis)*	7	-	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	15	-	100
PRAIRIE SEDGE *(Carex prairea)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1600 M

SOIL DRAINAGE: POORLY

FORAGE PRODUCTION (KG/HA)

TOTAL 1500*ESTIMATE

SUGGESTED GRAZING CAPACITY
1.2 HA/AUM

MONTANE FOREST ECOLOGY

The Montane subregion is distinguished from other subregions by having two distinct ecological sequences: Douglas-fir (Fd) and limber pine (Pf) in one sequence, and lodgepole pine(Pl) in another (Figure 4). Douglas-fir is the climax species on steep, south-facing, shallow rocky soils, and very coarse-textured outwash in valley bottoms (Strong 1992). Limber pine occupies exposed rocky outcrops where the environmental conditions are extreme. These sites are very xeric with shallow, poorly developed soils. Kuchar (1973) noted that the limber pine in Alberta is found at the northern limit of its range since it is found well below timberline. It is normally associated with high elevations or timberline south of Alberta where it takes on a krummholz form (dwarfed, contorted form, maintained by strong winds).

Closed-canopied lodgepole pine stands represent the primary reference vegetation for the montane subregion, since they often occur on mesic sites (Strong 1992). In contrast, closed-canopied aspen(Aw) stands tend to occur on sites that are warmer and drier than the reference sites (Strong 1992). Douglas-fir and white spruce(Sw) represent the potential climatic climax species for both lodgepole pine and aspen stands (Strong 1992; La Roi and Hnatiuk 1980). Balsam poplar(Pb), however, occupies the moistest sites and will succeed to white spruce since the high moisture content is not conducive to Douglas-fir succession.

Common understory species include thimbleberry, creeping mahonia, Canada buffaloberry, bearberry, snowberry and white meadowsweet. These species tend to define the ecosites and ecosite phases as described by Archibald et al. (1996). Thimbleberry and creeping mahonia are more common in the Castle area of the province. Moving north of Blairmore in the Montane thimbleberry is often replaced by cow parsnip and creeping mahonia by white meadowsweet on similar ecosites.

Many of the forested communities at lower elevations (1400-1500 m) in the Castle area were dominated by subalpine species (subalpine fir(Fa), Engelmann spruce(Se)), whereas the Montane grasslands in this area were described up to elevations of 2000 m. This resulted in a broad range of characteristic species on modal sites. Archibald et al. (1996) felt there had to be further refinement of the Subalpine subregion into upper and lower latitudinal subdivisions. Clearly, this would help to refine the classification of community types in the Castle area.

The common species, canopy cover, community characteristics and productivity are outlined.

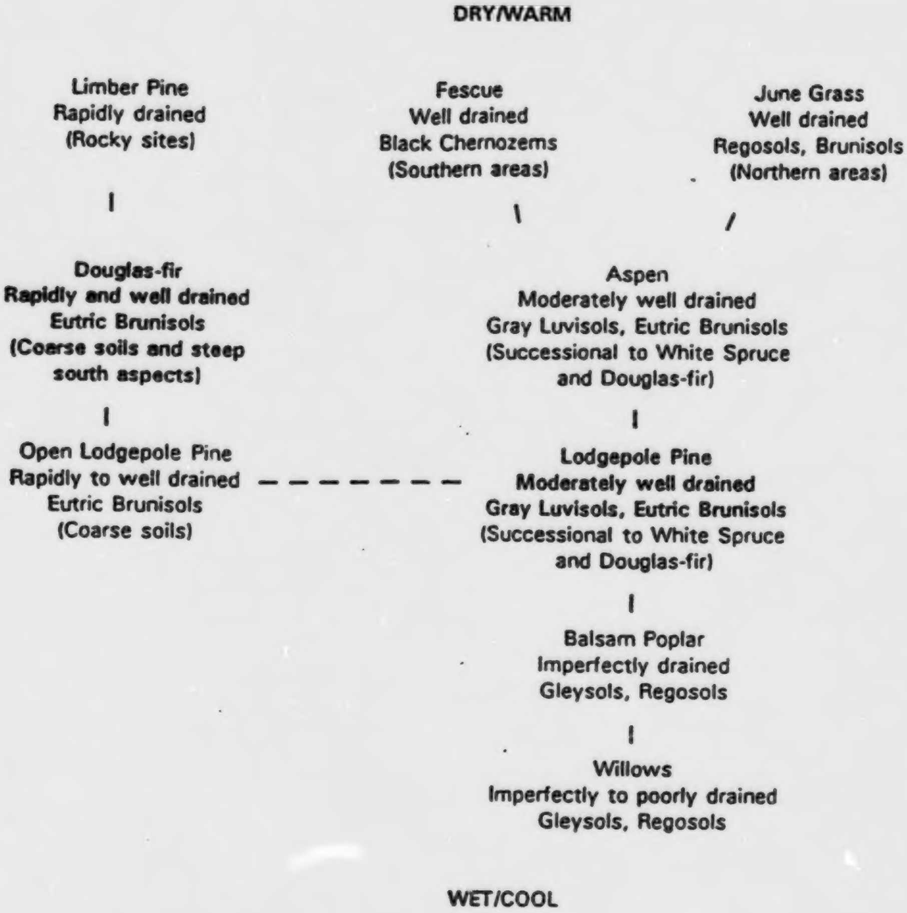

DRY/WARM
Limber Pine
Rapidly drained
(Rocky sites)
Fescue
Well drained
Black Chernozems
(Southern areas)
June Grass
Well drained
Regosols, Brunisols
(Northern areas)
Douglas-fir
Rapidly and well drained
Eutric Brunisols
(Coarse soils and steep
south aspects)
Aspen
Moderately well drained
Gray Luvisols, Eutric Brunisols
(Successional to White Spruce
and Douglas-fir)
Open Lodgepole Pine
Rapidly to well drained
Eutric Brunisols
(Coarse soils)
Lodgepole Pine
Moderately well drained
Gray Luvisols, Eutric Brunisols
(Successional to White Spruce
and Douglas-fir)
Balsam Poplar
Imperfectly drained
Gleysols, Regosols
Willows
Imperfectly to poorly drained
Gleysols, Regosols
WET/COOL

Figure 4: Ecological sequence of the plant communities in the Montane subregion along an environmental gradient (Strong 1992)

Table 4. Conifer, Mixedwood and Deciduous community types in the Montane subregion.

Community number	Community type	Productivity (kg/ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying Capacity (ha/AUM)
	Conifer community types							
E1	Pf/Rough fescue	-	-	-	1500*	Subxeric	Well	1.2
E2	Pf-Fd/Juniper/Bearberry	-	-	-	350*	Xeric	Rapidly	Non-use
E3	Pl/Bearberry-Juniper	97	150	350	597	Xeric	Rapidly	Non-use
E4	Sw-Pl/Alder/Bearberry	-	-	-	850*	Subxeric	Rapidly	Non-use
E5	Pl/Buffaloberry/Pinegrass	804	282	50	1172	Submesic	Well	Non-use
E6	Fd/Hairy wildrye	177	147	109	433	Mesic	Well	Non-use
E6a	Fd/Needle litter	330	33	68	431	Submesic	Well	Non-use
E6b	Fd/Timothy	984	172	-	1156	Submesic	Mod.well	Non-use
E7	Pl/Low bilberry/Hairy wildrye	108	32	50	190	Mesic	Rapidly	Non-use
E8	Pl/White meadowsweet	156	202	270	628	Submesic	Rapidly	Non-use
E9	Pl/Pinegrass	246	153	65	463	Mesic	Well	2.0
E10	Sw-Fd/White meadowsweet	149	106	79	333	Mesic	Well	Non-use
E10a	Fd/Snowberry	267	227	122	615	Mesic	Well	Non-use
E11	Pl/Moss	243	433	30	706	Mesic	Well	2.7
E12	Sw/Moss	60	138	4	201	Mesic	Well	Non-use
E13	Pl/Thimbleberry	390	460	187	1036	Mesic	Well	1.7
E14	Pl/Thimbleberry/Beargrass	80	856	1010	1946	Submesic	Rapidly	Non-use
E15	Pl/River alder-Thimbleberry	-	-	-	800*	Subhygric	Mod. Well	Non-use
E16	Sw/Thimbleberry	18	130	100	248	Mesic	Well	Non-use
E17	Sb-Lt/Labrador tea	-	-	-	500*	Hygric	Poorly	Non-use
	Castle							
E18	Se/Grouseberry	430	484	156	1064	Mesic	Well	Non-use
E19	Se/Moss	60	212	62	334	Mesic	Well	Non-use

Table 4. Continued

Community number	Community type	Productivity (kg/ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying Capacity (ha/AUM)
E20	Fa-Pl-Sw/White meadowsweet/Pinegrass	845	537	177	1480	Mesic	Rapidly	1.2
E21	Fa-Se/Heart lv'd arnica	16	153	239	408	Mesic	Well	Non-use
E22	Se/Clover-Oxeye daisy	-	-	-	604	Mesic	Well	3.8
	Mixedwood community types							
F1	Aw-Fd/Bearberry	-	-	-	600*	Submesic	Rapidly	3.0
F2	Sw-Pl/Yellow Mtn. avens	152	252	40	444	Submesic	Rapidly	Non-use
F3	Aw-Pl/Buffaloberry/Hairy wildrye	-	-	-	350*	Submesic	Rapidly	Non-use
F4	Aw-Pl/Pinegrass	600	384	0	984	Mesic	Well	1.8
F4a	Fd-Aw/Pinegrass	1268	98	6	1372	Submesic	Well	1.3
F5	Aw-Sw/Blueberry	330	46	48	424	Mesic	Well	Non-use
F6	Aw-Fd/White meadowsweet	-	-	-	800*	Mesic	Well	2.3
F7	Aw-Pb-Sw/Pinegrass	122	282	28	412	Mesic	Well	4.4
F8	Aw-Fa/Snowberry/Pinegrass	152	210	754	1116	Mesic	Well	1.6
F8a	Aw-Pl/Marsh reedgrass	1140	0	0	1140	Mesic	Well	1.6
F9	Pl-Aw/Snowberry/Kentucky bluegrass	668	774	506	1948	Submesic	Well	0.9
F10	Aw-Fa-Se/Timothy	1328	346	232	1906	Mesic	Well	0.9
F11	Spruce-Pb/Snowberry	97	681	237	1016	Subhygric	Well	1.8
F12	Sw-Aw/Scouring rush	-	-	-	800*	Subhygric	Mod. Well	Non-use
	Deciduous community types							
G1	Aw/Bearberry/Rough fescue	644	171	132	946	Submesic	Well	2.0
G2	Aw/Rose/Hairy wildrye	856	313	75	1244	Mesic	Well	1.5
G3	Aw/Hairy wildrye	836	1228	0	2064	Mesic	Well	1.3
G4	Aw/White meadowsweet/Pinegrass	425	531	190	1146	Mesic	Well	1.6
G5	Aw/Rose/Pinegrass	804	502	47	1338	Mesic	Well	1.4
G6	Aw/Pinegrass-Kentucky bluegrass	1005	584	126	1713	Mesic	Well	1.1

Table 4 continued

Community number	Community type	Productivity (kg/ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying Capacity (ha/AUM)
G7	Aw/Timothy-Kentucky bluegrass	1006	114	242	1362	Mesic	Well	1.3
G8	Aw/Snowberry-Saskatoon	653	406	335	1278	Mesic	Well	1.4
G9	Aw/Snowberry/Kentucky bluegrass	606	749	354	1709	Mesic	Well	1.1
G9a	Aw-Pb/Marsh reedgrass	1042	404	39	1485	Hygric	Well	1.2
G10	Aw/Thimbleberry	637	404	381	1422	Subhygric	Mod. Well	1.3
G11	Aw/Cow parsnip	525	2569	74	3169	Subhygric	Mod. Well	0.6
G12	Pb/Thimbleberry	36	1234	684	1954	Subhygric	Mod. Well	0.9
G13	Pb/Cow parsnip/Kentucky bluegrass	4	856	1010	1870*	Subhygric	Mod. Well	1.0
G14	Pb/Snowberry	382	483	893	1760	Mesic	Well	1.0
G15	Aw/Birch-Willow	804	452	622	1878	Subhygric	Mod. Well	Non-use

*estimate

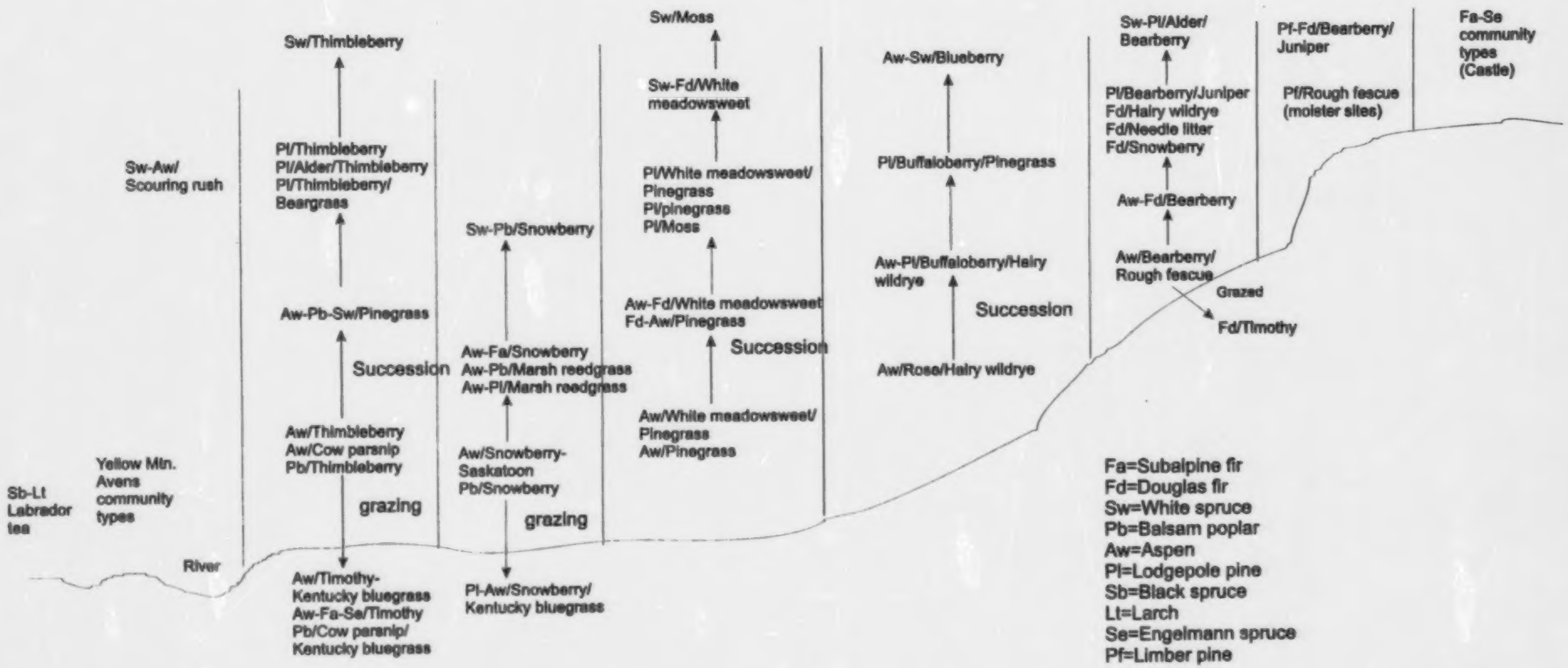

Sb-Lt
Labrador
tea
Yellow Mtn.
Avens
community
types
Sw-Aw/
Scouring rush
River
Sw/Thimbleberry
Pl/Thimbleberry
Pl/Alder/Thimbleberry
Pl/Thimbleberry/
Beargrass
Aw-Pb-Sw/Pinegrass
Succession
Aw/Thimbleberry
Aw/Cow parsnip
Pb/Thimbleberry
grazing
Aw/Timothy-
Kentucky bluegrass
Aw-Fa-Se/Timothy
Pb/Cow parsnip/
Kentucky bluegrass
Sw-Pb/Snowberry
Aw-Fa/Snowberry
Aw-Pb/Marsh reedgrass
Aw-Pl/Marsh reedgrass
Aw/Snowberry-
Saskatoon
Pb/Snowberry
grazing
Pl-Aw/Snowberry/
Kentucky bluegrass
Sw/Moss
Sw-Fd/White
meadowsweet
Pl/White meadowsweet/
Pinegrass
Pl/pinegrass
Pl/Moss
Aw-Fd/White meadowsweet
Fd-Aw/Pinegrass
Succession
Aw/White meadowsweet/
Pinegrass
Aw/Pinegrass
Aw-Sw/Blueberry
Pl/Buffaloberry/Pinegrass
Aw-Pl/Buffaloberry/Hairy
wildrye
Succession
Aw/Rose/Hairy wildrye
Sw-Pl/Alder/
Bearberry
Pl/Bearberry/Juniper
Fd/Hairy wildrye
Fd/Needle litter
Fd/Snowberry
Aw-Fd/Bearberry
Aw/Bearberry/
Rough fescue
Grazed
Fd/Timothy
Pf-Fd/Bearberry/
Juniper
Pf/Rough fescue
(moister sites)
Fa-Se
community
types
(Castle)
Fa=Subalpine fir
Fd=Douglas fir
Sw=White spruce
Pb=Balsam poplar
Aw=Aspen
Pl=Lodgepole pine
Sb=Black spruce
Lt=Larch
Se=Engelmann spruce
Pf=Limber pine

Figure 5. Landscape profile of the Forested community types in the Montane subregion

MONTANE SUBREGION

CONIFEROUS COMMUNITY TYPES

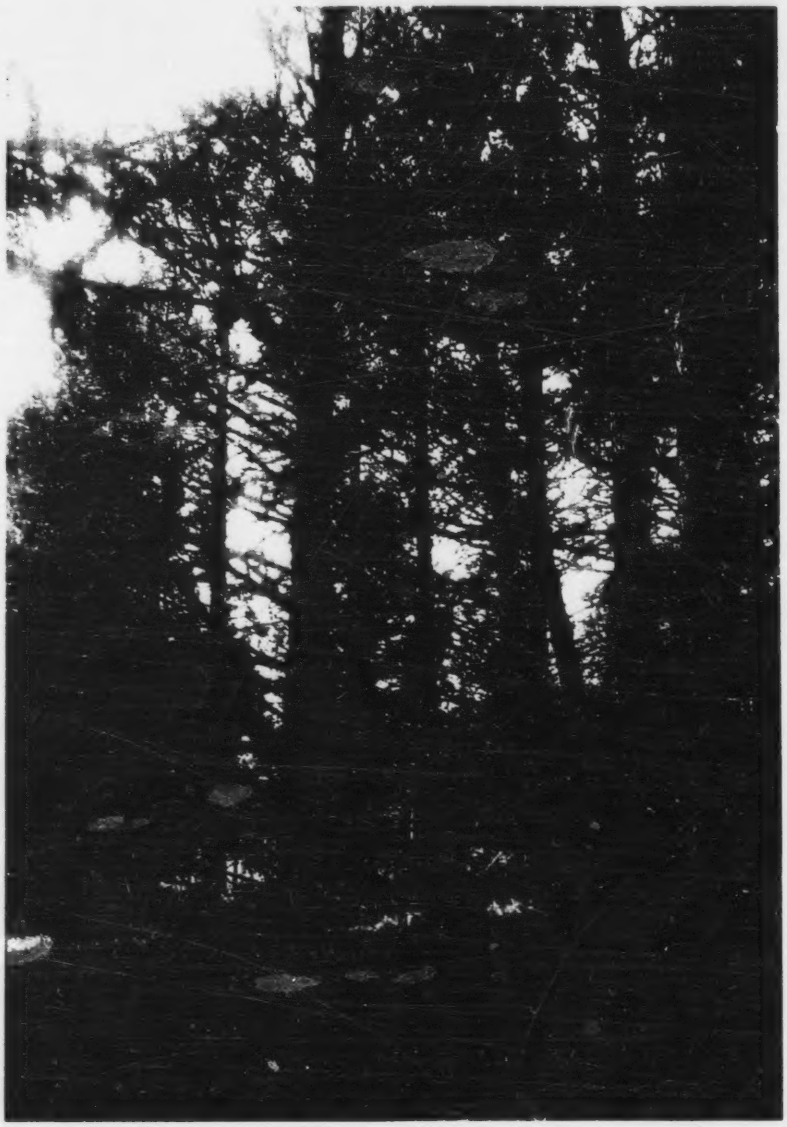
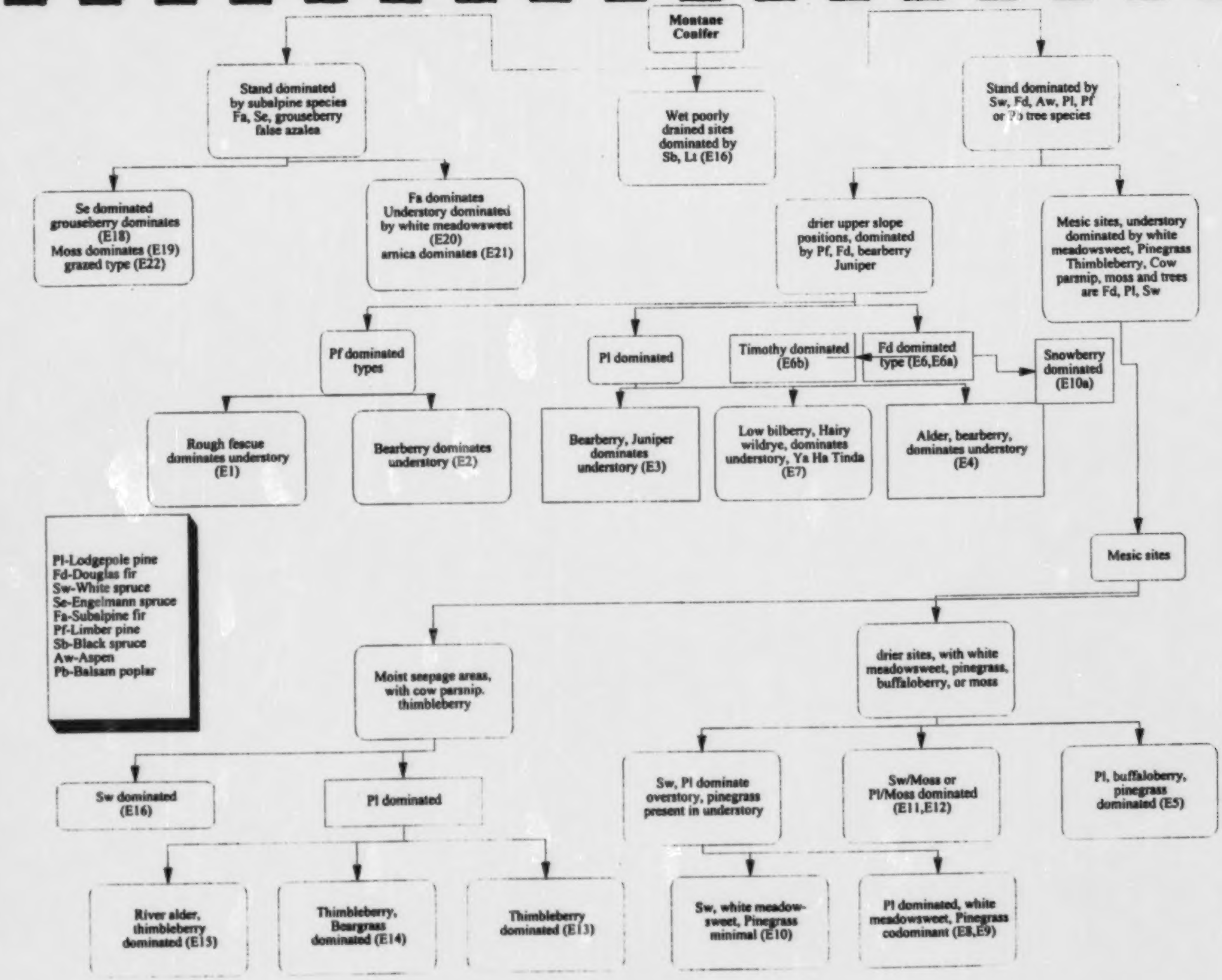


Photo 8: Conifer: This is a Douglas-fir-White spruce community type. Where the canopy opens up, grasses are fairly abundant and provide good forage for wildlife and livestock. In the absence of disturbance, this site will likely succeed to white spruce.


Montane Conifer
Stand dominated by subalpine species Fa, Se, grouseberry false azalea
Wet poorly drained sites dominated by Sb, Lt (E16)
Stand dominated by Sw, Fd, Aw, Pl, Pf or Pb tree species
Se dominated grouseberry dominates (E18) Moss dominates (E19) grazed type (E22)
Fa dominates Understory dominated by white meadowsweet (E20) arnica dominates (E21)
drier upper slope positions, dominated by Pf, Fd, bearberry Juniper
Mesic sites, understory dominated by white meadowsweet, Pinegrass Thimbleberry, Cow parsnip, moss and trees are Fd, Pl, Sw
Pf dominated types
Pl dominated
Timothy dominated (E6b)
Fd dominated type (E6,E6a)
Snowberry dominated (E10a)
Rough fescue dominates understory (E1)
Bearberry dominates understory (E2)
Bearberry, Juniper dominates understory (E3)
Low bilberry, Hairy wildrye, dominates understory, Ya Ha Tinda (E7)
Alder, bearberry, dominates understory (E4)
Pl-Lodgepole pine
Fd-Douglas fir
Sw-White spruce
Se-Engelmann spruce
Fa-Subalpine fir
Pf-Limber pine
Sb-Black spruce
Aw-Aspen
Pb-Balsam poplar
Mesic sites
Moist seepage areas, with cow parsnip. thimbleberry
drier sites, with white meadowsweet, pinegrass, buffaloberry, or moss
Sw dominated (E16)
Pl dominated
Sw, Pl dominate overstory, pinegrass present in understory
Sw/Moss or Pl/Moss dominated (E11,E12)
Pl, buffaloberry, pinegrass dominated (E5)
River alder, thimbleberry dominated (E15)
Thimbleberry, Beargrass dominated (E14)
Thimbleberry dominated (E13)
Sw, white meadowsweet, Pinegrass minimal (E10)
Pl dominated, white meadowsweet, Pinegrass codominant (E8,E9)

Key to coniferous community types of the Montane

E1: Pf/Rough fescue

(Pinus flexilis/Festuca scabrella)

n=1 This community type was described on a steep, west-facing slope with a subxeric moisture regime. The high cover of rough fescue distinguishes this community from other, more typical limber pine dominated community types. This community probably has deeper soils and is likely protected to some extent from the dry, dessicating winds that are normally associated with limber pine community types (Corns and Achuff 1982). These conditions would favour the growth of rough fescue.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LIMBER PINE *(Pinus flexilis)*	20	-	100
DOUGLAS-FIR *(Pseudotsuga menziesii)*	2	-	100
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	5	-	100
CREEPING JUNIPER *(Juniperus horizontalis)*	2	-	100
BRISTLY BLACK CURRANT *(Ribes lacustre)*	1	-	100
FORBS			
GOLDEN BEAN *(Thermopsis rhombifolia)*	4	-	100
COMMON YARROW *(Achillea millefolium)*	1	-	100
PASTURE SAGEWORT *(Artemisia frigida)*	1	-	100
WILD BERGAMOT *(Monarda fistulosa)*	1	-	100
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	95	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	-	100
PARRY OAT GRASS *(Danthonia parryi)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1475 M

SOIL DRAINAGE: WELL

SLOPE: 40%

ASPECT: WEST

FORAGE PRODUCTION (KG/HA)

TOTAL 1500 KG/HA*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
1.2 HA/AUM

E2: Pf-Fd/Juniper/Bearberry

(Pinus flexilis-Pseudotsuga menziesii/Juniperus communis/Arctostaphylos uva-ursi)

n=6 This community type occurs on steep, exposed ridge tops and upper slope positions within the montane subregion. It is characterized by dry site conditions and exposure to westerly winds. Soils are often shallow to bedrock (Archibald et al 1996), This community often forms an edaphic climax on these sites. Limber pine is normally associated with high elevations or timberline where it attains a Krummholz form (Kuchar 1973). However, the montane regions of Southwestern Alberta are found at the northern limits of the range for limber pine, thus they can generally be found at the lower elevations between prairie and coniferous forest. Limber pine, bearberry, juniper and the other associated species of this community type are all well adapted to the low moisture levels, high light intensity, heat and low soil nutrient levels which occur on these erosional, south-facing scarps (Kuchar 1973). Utilization of this site by livestock is often difficult because of the steep slope. These sites are generally considered non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS-FIR *(Pseudotsuga menziesii)*	4	0-15	83
LIMBER PINE *(Pinus flexilis)*	18	10-30	100
LODGEPOLE PINE (*Pinus contorta*)	2	0-10	17
SHRUBS			
GROUND JUNIPER *(Juniperus horizontalis)*	3	0-15	50
COMMON JUNIPER (*Juniperus communis*)	5	0-15	67
SASKATOON *(Amelanchier alnifolia)*	4	0-10	83
FORBS			
CUT LV'D ANEMONE *(Anemone multifida)*	4	0-15	83
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-5	50
BEARBERRY *(Arctostaphylos uva-ursi)*	11	0-63	17
NODDING ONION *(Allium cernuum)*	1	0-1	83
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	0-4	67
ROUGH FESCUE *(Festuca scabrella)*	4	0-14	67
PINEGRASS (*Calamagrostis rubescens*)	3	0-18	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: XERIC-SUBXERIC

NUTRIENT REGIME: SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION:
1519(980-1845) M

SLOPE: 14(2-30)%

ASPECT: SOUTHWESTERLY

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

TOTAL 350*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

E3: Pl/Bearberry-Juniper

(Pinus contorta/Arctostaphylos uva-ursi-Juniperus spp.)

n=5 This community type is similar to the Limber pine-Douglas-fir/Juniper/Bearberry community type previously described, but occurs on slightly richer and better developed soils. Dry site conditions from south exposures or coarse-textured soils are characteristic of this community type (Archibald et al. 1996). The dry site conditions limit the amount of forage this site can produce and the steep slope limits access to livestock. As a result, this community type would be considered non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LIMBER PINE *(Pinus flexilis)*	1	0-5	17
DOUGLAS-FIR *(Pseudotsuga menziesii)*	1	0-10	25
LODGEPOLE PINE *(Pinus contorta)*	44	3-70	100
SHRUBS			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	3	0-30	25
JUNIPER *(Juniperus spp.)*	6	0-31	75
SASKATOON *(Amelanchier alnifolia)*	1	0-2	33
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-2	16
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	2	0-16	50
FORBS			
NODDING ONION *(Allium cernuum)*	1	0-2	25
CUT-LEAVED ANEMONE *(Anemone multifida)*	1	0-2	33
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-11	75
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	1	0-9	25
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	1	0-6	42
SEDGE *(Carex spp.)*	2	0-9	33
PINEGRASS *(Calamagrostis rubescens)*	15	0-38	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
XERIC TO MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION RANGE:
1700(1460-2010) M

ASPECT: SOUTH TO WEST

SLOPE:
52(14-80)% (steep slopes and hill crests)

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	97(0-292)
FORB	150(0-276)
SHRUB	350(160-722)
TOTAL	597(160-998)

SUGGESTED GRAZING CAPACITY
NON-USE

E4: Sw-Pl/Alder/Bearberry

(Picea glauca-Pinus contorta/Alnus crispa/Arctostaphylos uva-ursi)

n=1 This community was described by Corns and Achuff (1982) in the Banff and Jasper Mountain ecodistricts. It occupies rapidly drained, level areas with a poor nutrient regime. This community is similar to Archibald et al's. (1996) bearberry Aw-Sw-Pl ecosite phase. Succession will generally be to white spruce, but succession rates will be slow because of the dry site conditions. The presence of green alder indicates there is a higher moisture content at some point in the growing season, making this community type slightly moister than the modal bearberry ecosite. The high tree cover and poor nutrient status would limit the amount of forage for domestic livestock. This community would be rated non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	10	-	100
WHITE SPRUCE *(Picea glauca)*	32	-	100
ASPEN *(Populus tremuloides)*	12	-	100
SHRUBS			
GROUND JUNIPER *(Juniperus communis)*	12	-	100
GREEN ALDER *(Alnus crispa)*	82	-	100
SASKATOON *(Amelanchier alnifolia)*	32	-	100
BUFFALOBERRY *(Shepherdia canadensis)*	30	-	100
TALL BILBERRY *(Vaccinium caespitosum)*	22	-	100
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	12	-	100
TWIN FLOWER *(Linnaea borealis)*	2	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	30	-	100
TIMOTHY *(Phleum pratense)*	20	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE : 1360 M

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

TOTAL 850*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

E5: Pl/Buffaloberry/Pinegrass

(Pinus contorta/Shepherdia canadensis/Calamagrostis rubescens)

n=4 This community type occurs on submesic, well drained, south and west-facing slopes. It is situated in slightly lower slope positions and therefore has better developed soils than the Limber pine and bearberry-dominated community types previously described. Archibald et al. (1996) described this community type as being part of the Canada buffaloberry-hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. This community type has only sparse understory vegetation and therefore has only limited forage for domestic livestock. It should be rated as non-use.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	52	35-71	100
ASPEN			
(Populus tremuloides)	1	0-5	25
SHRUBS			
CANADA BUFFALOBERRY			
(Shepherdia canadensis)	19	3-35	100
SHINING WILLOW			
(Salix lucida)	3	0-11	25
PRICKLY ROSE			
(Rosa acicularis)	1	0-2	25
FORBS			
STRAWBERRY			
(Fragaria virginiana)	4	1-13	100
SHOWY ASTER			
(Aster conspicuus)	11	0-30	75
HEART-LEAVED ARNICA			
(Arnica cordifolia)	5	0-15	75
FIREWEED			
(Epilobium angustifolium)	2	0-6	100
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	15	0-36	75
HAIRY WILD RYE			
(Elymus innovatus)	23	0-40	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBXERIC TO MESIC

NUTRIENT REGIME: SUBMESOTROPHIC

ELEVATION:
1544(1502-1580)M

ASPECT: SOUTHERLY

SLOPE: 17(5-30)%

SOIL DRAINAGE: RAPIDLY TO MODERATELY

FORAGE PRODUCTION (KG/HA)

GRASS	840
FORB	282
SHRUB	50
TOTAL	1172

SUGGESTED GRAZING CAPACITY
NON-USE

E6: Fd/Hairy wildrye

(Pseudotsuga menziesii/Elymus innovatus)

n=11 This community type occurs on steep, dry sites throughout the subregion. Douglas fir is usually restricted to steep, south facing slopes, shallow rocky soils and coarse-textured outwash in valley bottoms (Strong 1992). The soils of this type are not as rich as the previously described Pl/Buffaloberry, but are better than the bearberry and limber pine dominated ecosites. This community has a high cover of Douglas fir and a very sparse understory. Consquently, there is little forage available for domestic livestock. As a result, this community type would be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	3	0-20	18
DOUGLAS FIR (*Pseudotsuga menziesii*)	53	20-80	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	5	1-24	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	5	0-19	73
COMMON JUNIPER *(Juniperus communis)*	1	0-15	9
FORBS			
SHOWY ASTER *(Aster conspicuus)*	4	0-15	82
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-4	18
STRAWBERRY *(Fragaria virginiana)*	3	0-8	91
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	0-23	46
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	64
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	7	0-15	91
PINEGRASS (*Calamagrostis rubescens*)	3	0-13	73

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1565(1432-1765) M

ASPECT: VARIABLE

SLOPE: 13(3-45)%

SOIL DRAINAGE:
WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	177(0-498)
FORB	147(12-398)
SHRUB	109(0-564)
TOTAL	433(58-896)

SUGGESTED GRAZING CAPACITY
NON-USE

E6a: Fd/Needle litter

(Pseudotsuga menziesii)

n=1 This community type represents a mature Douglas fir forest. The closed canopy of Douglas fir limits the light reaching the forest floor restricting the growth of the understory vegetation. Consequently there is little forage available for domestic livestock and this community type would be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR (*Pseudotsuga menziesii*)	35	-	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	2	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	-	100
FORBS			
LOW GOLDENROD *(Solodago missourensis)*	4	-	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	3	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	1	-	100
THREE FLOWERED AVENS *(Geum triflorum)*	1	-	100
AMERICAN VETCH *(Vicia americana)*	1	-	100
GRASSES			
RICHARDSON'S NEEDLEGRASS *(Stipa richardsonii)*	8	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	-	100
PARRY'S OATGRASS *(Danthonia parryi)*	3	-	100
ROUGH FESCUE *(Festuca scabrella)*	2	-	100
IDAHO FESCUE *(Festuca idahoensis)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1570(1493-1649) M

ASPECT:
SOUTH

SLOPE:
20%

SOIL DRAINAGE:
WELL

FORAGE PRODUCTION (KG/HA)

GRASS	330(0-660)
FORB	33(0-66)
SHRUB	68(22-114)
TOTAL	431(114-748)

SUGGESTED GRAZING CAPACITY
NON-USE

E6b: Fd/Timothy

(Pseudotsuga menziesii/Phleum pratense)

n=1 This community type was described on a hill crest and represents a Douglas fir/Rough fescue dominated community type that has been extensively utilized by livestock. Livestock often congregate in these open Douglas fir stands on the hilltops. These sites are often windy, cool and the livestock can escape from the bugs. The heavy use on these sites favours the growth of timothy over the native grass species. These sites are quite productive and should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	1	-	100
DOUGLAS FIR *(Pseudotsuga menziesii)*	30	-	100
FORBS			
SPARROW'S EGG LADY'S SLIPPER *(Cypripedium paserinum)*	3	-	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	-	100
CANADA THISTLE *(Cirsium arvense)*	1	-	100
NORTHERN BEDSTRAW *(Galium boreal)*	1	-	100
LOW GOLDENROD *(Solodago missourensis)*	T	-	100
GRASSES			
TIMOTHY *(Phleum pratense)*	24	-	100
BLUE JOINT *(Calamagrostis canadensis)*	2	-	100
JUNE GRASS *(Koeleria macrantha)*	5	-	100
BLUE BUNCH WHEATGRASS *(Agropyron spicatum)*	5	-	100
HAIRY WILD RYE *(Elymus innovatus)*	2	-	100
AWNLESS BROME *(Bromus inermis)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1619 M

ASPECT: SOUTH

SLOPE: 2%

SOIL DRAINAGE:
MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

GRASS	984
FORB	172
TOTAL	1156

SUGGESTED GRAZING CAPACITY
NON-USE

E7: Pl/Low bilberry/Hairy wildrye

(Pinus contorta/Vaccinium cespitosum/Elymus innovatus)

n=1 This community is typical of the pine dominated community types adjacent to the grasslands within the Ya Ha Tinda area. They tend to be dry sites, that are well drained with poor to medium nutrient regimes. Forage production on these sites tends to be low because of the closed canopy cover. Succession in the absence of disturbance will be to white spruce.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	37	-	100
WHITE SPRUCE *(Picea glauca)*	5	-	100
SHRUBS			
LOW BILBERRY *(Vaccinium cespitosum)*	13	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	5	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	1	-	100
SMALL LEAVED EVERLASTING *(Antennaria parviflora)*	1	-	100
CUT LEAVED ANEMONE *(Anemone multifida)*	1	-	100
ALPINE HEDYSARUM *(Hedysarum alpinum)*	1	-	100
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	4	-	100
ROUGH FESCUE *(Festuca scabrella)*	3	-	100
LICHEN	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC-MESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1600 M

ASPECT:
VARIABLE

SOIL DRAINAGE:
RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	108
FORB	32
SHRUB	50
TOTAL	190

SUGGESTED GRAZING CAPACITY
NON-USE

E8: Pl/White meadowsweet

(Pinus contorta/Spiraea betulifolia)

n=6 This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by white meadowsweet, pinegrass or feather moss depending on the successional status of the stand. In the vicinity of the Crowsnest Pass creeping mahonia is also common on these sites (Archibald et al. 1996). White meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pinegrass. This community type produces little forage for domestic livestock and should be considered non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	54	34-80	100
ENGELMANN SPRUCE			
(Picea engelmannii)	4	0-23	17
SHRUBS			
CANADA BUFFALOBERRY			
(Shepherdia canadensis)	1	0-5	33
GROUND JUNIPER			
(Juniperus communis)	1	0-4	17
WHITE MEADOWSWEET			
(Spiraea betulifolia)	18	7-26	100
THIMBLEBERRY			
(Rubus parviflora)	8	0-35	67
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	4	0-13	83
HEART-LEAVED ARNICA			
(Arnica cordifolia)	4	1-8	100
SHOWY ASTER			
(Aster conspicuus)	3	0-11	33
TALL BILBERRY			
(Vaccinium membranaceum)	9	0-35	33
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	T	0-2	17
PINEGRASS			
(Calamagrostis rubescens)	10	0-35	67
MOSS SPP.	3	0-15	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE:
1602(1460-1768) M

ASPECT:
SOUTH TO SOUTHWEST

SLOPE: 24(2-53)%

SOIL DRAINAGE: WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	156(48-306)
FORB	202(36-434)
SHRUB	270(92-408)
TOTAL	628(434-1006)

SUGGESTED GRAZING CAPACITY
NON-USE

E9: Pl/Pinegrass

(Pinus contorta/Calamagrostis rubescens)

n=14 This community is dominated by a lodgepole pine overstory and an understory of pinegrass. Succession will be to white spruce or Douglas fir, but the extensive fire and disturbance history in the Montane has resulted in a predominance of lodgepole pine and Douglas fir (Archibald et al. 1996). This community is also very similar to the previously described Pl/White meadowsweet community type, but the high cover of pinegrass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pinegrass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is quite low. As a result, this community should be rated as secondary or non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	52	35-70	100
WHITE SPRUCE *(Picea glauca)*	6	0-30	62
SHRUBS			
ROSE *(Rosa acicularis)*	4	0-13	79
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-5	43
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	1	0-7	14
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-7	14
FORBS			
SHOWY ASTER *(Aster conspicuus)*	4	0-10	64
HEART-LEAVED ARNICA *(Arnica cordifolia)*	5	0-20	64
TWINFLOWER (*Linnaea borealis*)	17	0-50	86
STRAWBERRY (*Fragaria virginiana*)	8	1-36	100
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	9	0-42	64
PINEGRASS *(Calamagrostis rubescens)*	14	0-34	93
KEELED BROME *(Bromus carinatus)*	5	0-28	21

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION: 1550(1432-1676)M

SOIL DRAINAGE: WELL TO RAPIDLY

ASPECT: SOUTHERLY

SLOPE: 15(2-30)%

FORAGE PRODUCTION (KG/HA)

GRASS	246(80-308)
FORB	153(0-586)
SHRUB	65(0-182)
TOTAL	463(266-916)

SUGGESTED GRAZING CAPACITY
2.0 HA/AUM

E10: Sw-Fd/White meadowsweet

(Picea glauca-Pseudotsuga menziesii/Spiraea betulifolia)

n=4 This community type is successional more advanced than the Pl/White meadowsweet and Pl/Pinegrass community types previously described. Archibald et al. (1996) described the successional changes from pine to white spruce and douglas fir on these mesic/medium sites. As succession occurs there is less light reaching the forest floor and understory vegetation becomes very sparse. As a result, there is little forage for domestic livestock underneath these forested stands. This community type would be rated as non-use.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	34	25-60	100
DOUGLAS FIR			
(Pseudotsuga menziesii)	30	10-40	100
LODGEPOLE PINE			
(Pinus contorta)	4	0-10	50
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	3	0-5	50
THIMBLEBERRY			
(Rubus parviflorus)	3	0-8	50
TWIN FLOWER			
(Linnaea borealis)	3	0-9	50
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	1	0-1	50
SHOWY ASTER			
(Aster conspicuus)	1	0-3	75
FIREWEED			
(Epilobium angustifolium)	1	0-1	25
WESTERN MEADOW RUE			
(Thalictrum occidentale)	5	6-12	50
FALSE SOLOMON'S SEAL			
(Smilacina racemosa)	1	0-3	50
HEART-LEAVED ARNICA			
(Arnica cordifolia)	3	0-8	50
GRASSES			
HAIRY WILDRYE			
(Elymus innovatus)	1	0-4	50
PINEGRASS			
(Calamagrostis rubescens)	4	0-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1556(1487-1600)M

ASPECT: VARIABLE

SLOPE: 23(14-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	149(20-366)
FORB	106(42-154)
SHRUB	79(0-166)
TOTAL	333(222-480)

SUGGESTED GRAZING CAPACITY
NON-USE

E10a: Fd/Snowberry

(Pseudotsuga menziesii/Symphoricarpos occidentalis)

n=4 This community type was described on moderate south and westerly facing slopes on the east side of the Porcupine Hills. Snowberry is generally indicative of nutrient rich seepage areas in the Montane subregion and generally forms thickets in the lower slope positions. The snowberry in this community type consists of small individual plants that are uniformly scattered throughout the community. Archibald et al. (1996) did not recognize this community type and placed it within the hairy wildrye (submesic/medium) ecosite because of the moderate slopes the community was described on. However, the high constancy of snowberry in this community type appears to indicate slightly higher moisture and nutrients. Consequently, this community type was placed within the mesic/medium ecosite. Livestock may use these community types because of the open nature of the tree canopy, but the forage production is only moderate and the areas where this community type were described are generally inaccessible to livestock. As a result this community type should be rated as non-use range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR			
(Pseudotsuga menziesii)	41	25-55	100
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	4	0-14	50
SNOWBERRY			
(Symphoricarpos occidentale)	10	7-11	100
PRICKLY ROSE			
(Rosa acicularis)	2	0-2	100
PIN CHERRY			
(Prunus pensylvanica)	1	0-3	25
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	2	0-3	100
SHOWY ASTER			
(Aster conspicuus)	2	0-6	25
BALSAMROOT			
(Balsamorhiza sagittata)	2	0-8	25
WESTERN MEADOW RUE			
(Thalictrum occidentale)	1	0-4	25
AMERICAN VETCH			
(Vicia americana)	1	0-2	100
STAR-FLOWERED SOLOMON'S-SEAL			
(Smilacina stellata)	1	0-2	75
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	4	0-12	75
GREEN NEEDLE GRASS			
(Stipa viridula)	2	0-4	75
SEDGE			
(Carex spp.)	2	1-3	75
PARRY'S OATGRASS			
(Danthonia parryi)	5	0-10	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION: 1486 (1448-1524)M

ASPECT: VARIABLE

SLOPE: 11(5-15)%

SOIL DRAINAGE: WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	267(112-442)
FORB	227(0-408)
SHRUB	122(0-184)
TOTAL	615(112-898)

SUGGESTED GRAZING CAPACITY
NON-USE

E11: Pl/Moss

(Pinus contorta/Moss spp.)

n=6 This community type is similar to the previously described Pl/Pinegrass and Pl/White meadowsweet communities, but represents further succession. This community was described on moister sites, which probably escaped fire and disturbance, allowing succession to occur. Continued succession in the absence of disturbance will likely be to the Sw/Moss dominated community type. This community type is moderately productive for domestic livestock. The higher moisture conditions favour the growth of fireweed and aster spp. These species are moderately palatable to livestock. This community type would be rated as secondary range for domestic livestock.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	4	0-19	50
LODGEPOLE PINE *(Pinus contorta)*	42	13-69	100
SHRUBS			
WILLOW *(Salix spp.)*	2	0-5	67
WHITE MEADOWSWEET *(Spiraea betulifolia)*	T	0-1	50
BUFFALOBERRY *(Shepherdia canadensis)*	2	0-5	50
FORBS			
STRAWBERRY *(Fragaria virginiana)*	21	13-28	100
FIREWEED *(Epilobium angustifolium)*	10	1-19	100
LINDLEY'S ASTER *(Aster ciliolatus)*	16	5-22	100
DANDELION *(Taraxacum officinale)*	6	1-17	100
WESTERN MEADOW RUE *(Thalictrum occidentale)*	3	0-6	83
GRASSES			
SEDGE *(Carex spp.)*	11	4-20	100
VIRGINIA WILDRYE *(Elymus virginicus)*	8	2-14	100
MOSS	46	12-65	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO HYGRIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1742 (1707-1798)M

ASPECT: NORTHERLY

SLOPE: 1%

DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

GRASS	243(0-570)
FORB	433(0-832)
SHRUB	30(0-96)
TOTAL	706(136-1402)

SUGGESTED GRAZING CAPACITY
2.7 HA/AUM

E12: Sw/Moss

(Picea glauca/Moss spp.)

n=7 This community type is similar to the previously described Sw-Fd/White meadowsweet community, but represents further succession. This community was described on northerly aspects, which probably escaped fire and disturbance, allowing succession to occur. Note as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the Pl community types to 201 kg/ha in this community type. This community type would be rated as non-use for domestic livestock.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	64	10-90	100
ASPEN *(Populus tremuloides)*	2	0-15	14
SHRUBS			
PRICLY ROSE *(Rosa acicularis)*	2	0-4	71
WHITE MEADOWSWEET *(Spiraea betulifolia)*	T	0-1	43
FORBS			
HEART-LEAVED ARNICA *(Arnica cordifolia)*	6	0-18	57
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-3	14
SHOWY ASTER *(Aster conspicuus)*	1	0-5	29
TWINFLOWER *(Linnaea borealis)*	8	0-19	71
WINTERGREEN *(Pyrola asarifolia)*	1	0-2	71
GRASSES			
SEDGE *(Carex spp.)*	2	0-10	57
HAIRY WILDRYE *(Elymus innovatus)*	2	0-5	71
MOSS	34	0-78	71

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: SUBMESOTROPHIC TO MESOTROPHIC

ELEVATION: 1448 (1330-1500)M

ASPECT: NORTHERLY

SLOPE: 13(1-35)%

SOIL DRAINAGE: WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	60(2-148)
FORB	138(60-246)
SHRUB	3(0-12)
TOTAL	201(66-394)

SUGGESTED GRAZING CAPACITY
NON-USE

E13: Pl/Thimbleberry

(Pinus contorta/Rubus parviflorus)

n=5 Nutrient rich seepage occurs on this community type at some point in the growing season favouring the growth of thimbleberry. On these sites thimbleberry is very common south of the Crowsnest Pass and is generally replaced by cow parsnip north of the Pass. Succession on these sites will be from aspen to pine and then to white spruce. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Thimbleberry is generally unpalatable to livestock, but if the site has an abundance of cow parsnip it may be extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	48	20-65	100
WHITE SPRUCE			
(Picea glauca)	2	0-10	20
SHRUBS			
THIMBLEBERRY			
(Rubus parviflorus)	32	5-55	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	9	1-14	100
FORBS			
HEART-LEAVED ARNICA			
(Arnica cordifolia)	5	4-6	100
LINDLEY'S ASTER			
(Aster ciliolatus)	2	1-7	100
STRAWBERRY			
(Fragaria virginiana)	2	1-4	100
FIELD HORSETAIL			
(Equisetum arvense)	6	0-15	40
COW PARSNIP			
(*Heracleum lanatum*)	3	0-6	40
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	4	0-12	60
BROME			
(Bromus vulgaris)	3	0-6	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION:1584 (1478-1661) M

SLOPE: 18(7-37)%

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	390(118-1132)
FORB	460(142-1152)
SHRUB	187(0-616)
TOTAL	1036(398-1346)

SUGGESTED GRAZING CAPACITY
1.5 HA/AUM

E14: Pl/Thimbleberry/Beargrass

(Pinus contorta/Rubus parviflorus/Xerophyllum tenax)

n=1 This community type is very similar to the Pl/Thimbleberry community type previously described, but contains a high cover of beargrass. Archibald et al. (1996) recognized these beargrass-dominated community types in the extreme southern portion of the subregion. Beargrass is well suited to growing on hillsides and dry subalpine meadows and appears to indicate the transition from the lower Montane subregion to the upper Subalpine subregion. The tender seed pods are often eaten by small rodents and elk. In the winter Mountain goats often eat the leaves (Craighead et al. 1963). The tough leaves of beargrass are unpalatable to livestock.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	45	-	100
WHITE SPRUCE *(Picea glauca)*	3	-	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	34	-	100
WILLOW (*Salix spp.*)	19	-	100
WHITE MEADOWSWEET (*Spiraea betulifolia*)	17	-	100
FORBS			
BEARGRASS *(Xerophyllum tenax)*	54	-	100
GROUSEBERRY *(Vaccinium scoparium)*	23	-	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	9	-	100
EARLY BLUE VIOLET *(Viola adunca)*	3	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	9	-	100
GRASSES			
BROME *(Bromus vulgaris)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1494 M

SLOPE: 15%

ASPECT: SOUTHWEST

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	80
FORB	856
SHRUB	1010
TOTAL	1946

SUGGESTED GRAZING CAPACITY
NON-USE

E15: Pl/River alder-Thimbleberry

(Pinus contorta/Alnus tenuifolia-Rubus parviflorus)

n=1 This community type is very similar to the previously described Pl/Thimbleberry and Pl/Thimbleberry/Beargrass community types, but contains river alder. River alder tends to be found growing on nutrient seepage areas with high water tables. This community type is probably moister than the other Pl/Thimbleberry dominated types, but dries out at some time during the growing season which favours the growth of thimbleberry. The high cover of alder limits the light reaching the forest floor and results in low production of grass and forbs. The majority of the total production comes from alder which is unpalatable and generally inaccessible to livestock. Consequently, this community type would be rated as non-use.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	1	-	100
LODGEPOLE PINE *(Pinus contorta)*	10	-	100
SHRUBS			
RIVER ALDER *(Alnus tenuifolia)*	30	-	100
THIMBLEBERRY *(Rubus parviflorus)*	15	-	100
GREEN ALDER *(Alnus crispa)*	10	-	100
ROSE *(Rosa acicularis)*	10	-	100
FORBS			
DEWBERRY *(Rubus pubescens)*	10	-	100
FIELD HORSETAIL *(Equisetum arvense)*	5	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	2	-	100
HAIRY WILDRYE *(Elymus innovatus)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME : PERMESOTROPHIC

ELEVATION: 1300 M

SLOPE: 12%

ASPECT: NORTH

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

TOTAL 800 KG/HA*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

E16: Sw/Thimbleberry

(Picea glauca/Rubus parviflorus)

n=1 This community type is very similar to the Pl/Thimbleberry dominated community types previously described, but is successionally more advanced. Succession on the thimbleberry dominated ecosites will be from aspen to pine and then to white spruce (Archibald et al. 1996). The northerly aspect of this particular community type has allowed the site to escape disturbance by fire and succession has occurred to white spruce. Note as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the Pl community types to 250 kg/ha in this community type. This community type would be rated as non-use for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	75	-	100
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
THIMBLEBERRY *(Rubus parviflorus)*	11	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	1	-	100
TWINFLOWER *(Linnaea borealis)*	4	-	100
HEART-LEAVED ARNICA *(Arnica cordifolia)*	2	-	100
MOSSES	68	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION:1570M

SLOPE:10%

ASPECT: NORTH

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	18
FORB	130
SHRUB	100
TOTAL	248

SUGGESTED GRAZING CAPACITY
NON-USE

E17: Sb-Lt/Labrador tea

(Picea mariana-Larix laricina/Ledum groenlandicum)

n=1 This community type occurs in association with lowland boggy areas. The water table under this type has begun to drop which has allowed succession toward a white spruce-dominated community. Generally, black spruce-larch dominated communities are considered successionally mature because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. This community type is likely flooded in the spring, therefore, it may provide a scource of water for livestock early in the year. However, due to poor access and the limited number of palatable plants available, this community type would be considered non-use.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	20	-	100
WHITE SPRUCE *(Picea glauca)*	20	-	100
LARCH *(Larix laricina)*	5	-	100
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	10	-	100
MYRTLE-LEAVED WILLOW *(Salix myrtillifolia)*	10	-	100
FORBS			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	5	-	100
TWINFLOWER *(Linnaea borealis)*	5	-	100
DWARF SCOURING RUSH *(Equisetum scirpoides)*	4	-	100
COMMON HORSETAIL *(Equisetum arvense)*	3	-	100
NORTHERN COMANDRA *(Geocaulon lividum)*	2	-	100
GRASSES			
SHEATHED SEDGE *(Carex vaginata)*	15	-	100
HAIRY WILDRYE (*Elymus innovatus*)	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME : SUBMESOTROPHIC

ELEVATION: 1220 M

SOIL DRAINAGE: POORLY

FORAGE PRODUCTION (KG/HA)

TOTAL 500 KG/HA*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

E18: Se/Grouseberry/Moss

(Picea engelmannii/Vaccinium scoparium/Moss)

n=1 This community represents a subalpine forested community type with mesic moisture regimes and medium nutrient regimes. Subalpine fir, Englemann spruce, false azalea and grouseberry rarely occur at lower elevations and therefore are characteristic of the subalpine environment. The Castle area of the province is unusual in that the subalpine forested communities can be found at lower montane elevations and the montane grasslands can be found at alpine and subalpine elevations. Clearly there is a strong overlap between the Montane and Subalpine subregions of this area of the province. It is for this reason that the forested community types for the Castle area are described in this guide.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	26	-	100
WHITE SPRUCE *(Picea glauca)*	21	-	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	3	-	100
FALSE AZALEA *(Menziesia ferruginea)*	3	-	100
GROUSEBERRY *(Vaccinium scoparium)*	15	-	100
FORBS			
FIREWEED *(Epilobium angustifolium)*	17	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	67	-	100
YELLOW BEARDTONGUE *(Penstemon confertus)*	5	-	100
SMOOTH ASTER *(Aster laevis)*	1	-	100
GRASSES			
NORTHERN REEDGRASS *(Calamagrostis inexpansa)*	23	-	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	-	100
MOSS	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1530 M

ASPECT: EAST

SLOPE: 10%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	430
FORB	484
SHRUB	156
TOTAL	1064

SUGGESTED GRAZING CAPACITY
NON-USE

E19. Se/Moss

(Picea engelmannii/Moss)

n=3 This community type is very similar to the previously described Se/Grouseberry community type, but lacks the cover of grouseberry. Grouseberry is well adapted to growing at higher elevations in the subalpine and is very common at timberline between the subalpine and alpine environments (Willoughby and Smith 1997). The lack of grouseberry in this community type may indicate warmer sites than the previously described Se/Grouseberry community. This community would be rated as non-use for domestic livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	57	43-66	100
BALSAM POPLAR *(Populus balsamifera)*	11	0-33	33
SUBALPINE FIR (*Abies lasiocarpa*)	5	0-15	33
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	5	0-8	67
SNOWBERRY *(Symphoricarpos occidentalis)*	15		
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-3	67
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	5		
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-3	67
HEART-LEAVED ARNICA *(Arnica cordifolia)*	10	0-29	67
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	1	100
SHOWY ASTER *(Aster conspicuus)*	4	0-11	67
BUNCHBERRY *(Cornus canadensis)*	5	0-14	33
GRASSES			
TALL TRISETUM *(Trisetum canescens)*	3	0-9	33
MOSSES	18	2-44	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1561(1433-1798)M

SLOPE: 21(5-37)%

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	60(28-82)
FORB	212(56-356)
SHRUB	62(0-108)
TOTAL	334(162-546)

SUGGESTED GRAZING CAPACITY
NON-USE

E20:Fa-Pl-Sw/White meadowsweet/Pinegrass

(Abies lasiocarpa-Pinus contorta-Picea glauca/Spiraea betulifolia/Calamagrostis rubescens)

n=12 This community is indicative of the overlap between the Subalpine and Montane subregions of the Castle area. The overstory is dominated by subalpine fir a species characteristic of the subalpine environment, but the understory is dominated by white meadowsweet and pinegrass species characteristic of the montane environment. This community type occupies submesic to mesic sites, on moderate slopes with variable aspects. Forage productivity is moderate averaging 1200 kg/ha, but the majority of the understory vegetation is unpalatable. As a result this community should be only rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR			
(Abies lasiocarpa)	33	0-70	92
WHITE SPRUCE			
(Picea glauca)	25	3-50	100
LODGEPOLE PINE			
(Pinus contorta)	20	0-75	83
SHRUBS			
SNOWBERRY			
(Symphoricarpos occidentalis)	7	0-30	92
WHITE MEADOWSWEET			
(Spiraea betulifolia)	6	0-25	83
THIMBLEBERRY			
(Rubus parviflora)	2	0-11	50
FALSE AZALEA			
(Menziesii ferruginea)	3	0-14	33
FORBS			
FIREWEED			
(Epilobium angustifolium)		3	0-9
83			
WESTERN MEADOW RUE			
(Thalictrum occidentale)	2	0-4	83
WILD STRAWBERRY			
(Fragaria virginiana)	16	0-40	83
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	3	0-6	75
SHOWY ASTER			
(Aster conspicuus)	2	0-6	67
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	14	0-41	83
SEDGE			
(Carex spp.)	2	0-10	42

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBMESIC

NUTRIENT REGIME : MESOTROPHIC

ELEVATION: 1592 (1493-1981)M

SLOPE: 14(3-40)%

ASPECT: VARIABLE

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	845(78-4100)
FORB	537(152-910)
SHRUB	177(0-682)
TOTAL	1480(462-4482)

SUGGESTED GRAZING CAPACITY
1.5 HA/AUM

E21: Fa-Se/Heart-leaved arnica

(Abies lasiocarpa-Picea engelmannii/Arnica cordifolia)

n=3 This community type is very similar to the Se/Moss community previously described, but contains a high cover of subalpine fir. Succession in the subalpine is from lodgepole pine to Engelmann spruce and subalpine fir (Archibald et al. 1996). This community type appears to represent the climatic climax for sites with subalpine environments in the Castle area of the province. The northerly aspects of the two described sites probably allowed them to escape the recent fire history and undergo succession. As these forested sites succeed towards climax there is very little light reaching the forest floor. As a result, there is little forage for domestic livestock and this community would be rated as non-use

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	55	25-80	100
ENGELMANN SPRUCE *(Picea engelmannii)*	21	15-30	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	2	0-4	33
FALSE AZALEA *(Menziesia ferruginea)*	23	0-65	67
GREEN ALDER *(Alnus crispa)*	11	0-33	33
FORBS			
HEART- LEAVED ARNICA *(Arnica cordifolia)*	24	20-27	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	3		
ONE FLOWERED WINTERGREEN *(Moneses uniflora)*	2	0-2	67
SUGARSCOOP *(Tiarella unifoliata)*	2	0-3	67
GRASSES			
SEDGE *(Carex spp.)*	2	0-3	67
MOSSES	10	0-22	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME : MESOTROPHIC

ELEVATION: 1760(1740-1788)M

SLOPE: 25(21-30)%

ASPECT: NORTHERLY

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	16(0-48)
FORB	153(0-356)
SHRUB	239(0-718)
TOTAL	408(48-1074)

SUGGESTED GRAZING CAPACITY
NON-USE

E22: Se/Clover-Oxeye daisy

(Picea engelmannii/Trifolium repens-Chrysanthemum leucanthemum)

n=1 This community type represents a forested community type that has been heavily utilized by livestock. The heavy utilization has allowed clover and oxeye daisy to invade into the understory. Once established oxeye daisy is very invasive and difficult to control. The authors have seen whole fields taken over by this plant species. This plant is unpalatable to livestock so when invasion occurs there is a corresponding drop in forage production.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	12	-	100
ENGELMANN SPRUCE *(Picea engelmanii)*	11	-	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	7	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6	-	100
THIMBLEBERRY *(Rubus parviflora)*	4	-	100
FORBS			
OX-EYE DAISY *(Chrysanthemum leucanthemum)*	17	-	100
CLOVER *(Trifolium repens)*	15	-	100
TALL BILBERRY *(Vaccinium myritillus)*	7	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	-	100
TWINFLOWER *(Linnaea borealis)*	4	-	100
DANDELION *(Taraxacum offincinale)*	3	-	100
GRASSES			
SEDGE *(Carex spp.)*	4	-	100
PINEGRASS *(Calamagrostis rubescens)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1557 M

SLOPE: 9%

ASPECT: EAST

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

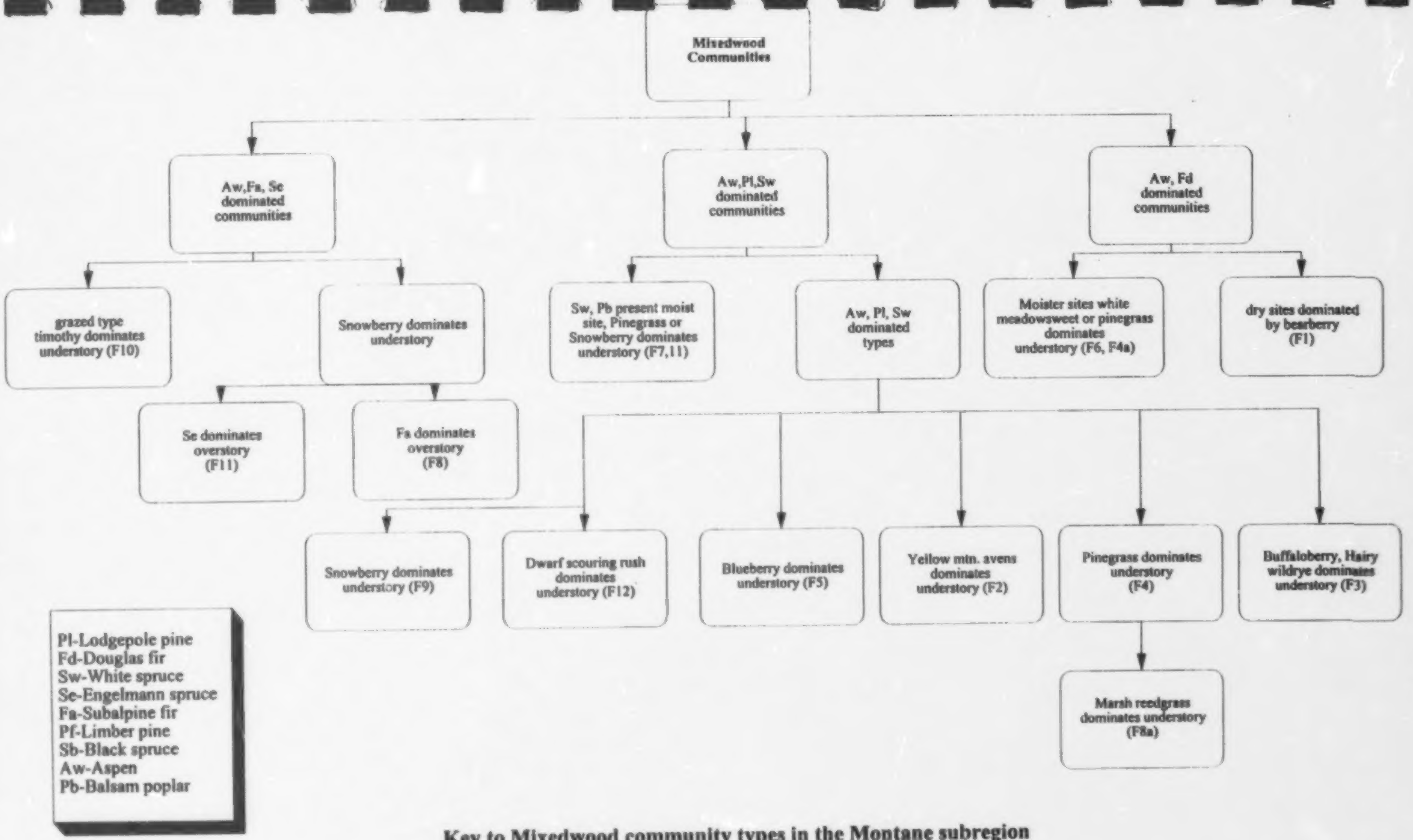
GRASS	150
FORB	88
SHRUB	366
TOTAL	604

SUGGESTED GRAZING CAPACITY
3.8 HA/AUM

MONTANE SUBREGION

MIXEDWOOD COMMUNITY TYPES

Photo 9: This represents an Aw-Sw mixedwood community type. There is a good forage base under the aspen, however as the spruce cover increases productivity will decline.


Mixedwood Communities
Aw,Fa, Se dominated communities
Aw,Pl,Sw dominated communities
Aw, Fd dominated communities
grazed type timothy dominates understory (F10)
Snowberry dominates understory
Sw, Pb present moist site, Pinegrass or Snowberry dominates understory (F7,11)
Aw, Pl, Sw dominated types
Moister sites white meadowsweet or pinegrass dominates understory (F6, F4a)
dry sites dominated by bearberry (F1)
Se dominates overstory (F11)
Fa dominates overstory (F8)
Snowberry dominates understory (F9)
Dwarf scouring rush dominates understory (F12)
Blueberry dominates understory (F5)
Yellow mtn. avens dominates understory (F2)
Pinegrass dominates understory (F4)
Buffaloberry, Hairy wildrye dominates understory (F3)
Marsh reedgrass dominates understory (F8a)
Pl-Lodgepole pine
Fd-Douglas fir
Sw-White spruce
Se-Engelmann spruce
Fa-Subalpine fir
Pf-Limber pine
Sb-Black spruce
Aw-Aspen
Pb-Balsam poplar

Key to Mixedwood community types in the Montane subregion

F1: Aw-Fd/Bearberry

(Populus tremuloides-Pseudotsuga menziesii/Arctostaphylos uva-ursi)

n=1 This community represents an aspen dominated community type that is undergoing succession to douglas fir. It is part of the bearberry ecosite described by Archibald et al. (1996). This ecosite occupies dry upper slope positions with south exposures and coarse textured soils. Forage production on this site will be low because of the dry site conditions and livestock will have a difficulty accessing the upper slope position. This community should be rated as secondary range

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	34	-	100
Douglas-fir *(Pseudotsuga menziesii)*	23	-	100
Shrubs			
Saskatoon *(Amelanchier alnifolia)*	9	-	100
Creeping juniper *(Juniperus horizontalis)*	12	-	100
Buffaloberry *(Shepherdia canadensis)*	2	-	100
Forbs			
Bearberry *(Arctostaphylos uva-ursi)*	43	-	100
Common yarrow *(Achillea millefolium)*	3	-	100
Strawberry *(Fragaria virginiana)*	9	-	100
Cut-leaved anemone *(Anemone multifida)*	3	-	100
Grasses			
Sedge *(Carex spp.)*	10	-	100
Slender wheat grass *(Agropyron trachycaulum)*	3	-	100
Pinegrass *(Calamagrostis rubescens)*	9	-	100

Environmental Variables

Moisture regime: Submesic

Nutrient regime: Mesotrophic

Elevation: 1661 m

Soil drainage: Rapidly

Slope: 15%

Aspect: South

Forage Production (kg/ha)

Total 600 kg/ha*
(*Estimated)

Suggested Grazing Capacity
3.0 ha/AUM

F2: Sw-Pl-Pb/Yellow Mtn. avens

(Picea glauca-Pinus contorta-Populus balsamifera/Dryas drummondii)

n=1 This community is typical of dry, gravelly river flats with nutrient poor soils. It is similar to the Yellow Mtn. avens /Junegrass community type previously described, but this community type is successionally more advanced. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community type should be rated as non-use.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	39	-	100
LODGEPOLE PINE *(Pinus contorta)*	20	-	100
BALSAM POPLAR *(Populus balsamifera)*	17	-	100
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	4	-	100
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
FORBS			
YELLOW MTN. AVENS *(Dryas drummondii)*	12	-	100
SHOWY ASTER *(Aster conspicuus)*	7	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	3	-	100
SHOWY LOCOWEED *(Oxytropis splendens)*	2	-	100
GRASSES			
CANADA BLUEGRASS *(Poa compressa)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1547 M

SLOPE: 1%

ASPECT: NORTH

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	152
FORB	252
SHRUB	40
TOTAL	444

SUGGESTED GRAZING CAPACITY
NON-USE

F3: Aw-Pl/Buffaloberry/Hairy wildrye

(Populus tremuloides-Pinus contorta/Shepherdia canadensis/Elymus innovatus)

n=1 This community occurs on submesic, well drained, south and west-facing slopes. It is very similar to the Pl/Buffaloberry/Pinegrass community type previously described, but is in an earlier successional stage. The forage productivity on this community is only moderate and should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	43	-	100
LODGEPOLE PINE *(Pinus contorta)*	21	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	12	-	100
SASKATOON *(Amelanchier alnifolia)*	1	-	100
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	15	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	9	-	100
CREEPING MAHONIA *(Berberis repens)*	6	-	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	-	100
DANDELION *(Taraxacum officinale)*	2	-	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	20	-	100
PINEGRASS *(Calamagrostis rubescens)*	14	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1608 M

ASPECT: SOUTH

SLOPE: 7%

SOIL DRAINAGE: RAPIDLY

FORAGE PRODUCTION (KG/HA)

TOTAL 350 KG/HA*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

F4: Aw-Pl/Pinegrass

(Populus tremuloides-Pinus contorta/Calamagrostis rubescens)

n=1 This community type is dominated by an overstory of aspen and lodgepole pine, and represents the mid successional stage between an Aw/Pinegrass and Pl/Pinegrass dominated community type. Pinegrass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is midway between the aspen dominated community (1278 kg/ha) and the pine dominated community (598 kg/ha). This community would be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	COSNT.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	40	-	100
ASPEN *(Populus tremuloides)*	40	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	2	-	100
FORBS			
TWINFLOWER *(Linnaea borealis)*	25	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	16	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	14	-	100
RICHARDSON'S GERANIUM *(Geranium richardsonii)*	12	-	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	6	-	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	38	-	100
FRINGED BROME *(Bromus ciliatus)*	13	-	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1554 M

SOIL DRAINAGE: MOD.WELL

FORAGE PRODUCTION (KG/HA)

GRASS	600
FORB	384
TOTAL	984

SUGGESTED GRAZING CAPACITY
1.8 HA/AUM

F4a: Fd-Aw/Pinegrass

(Pseudotsuga menziesii-Populus tremuloides/Calamagrostis rubescens)

n=1 This community type is dominated by an overstory of aspen and Douglas fir, and represents the mid successional stage between an Aw/Pinegrass and Fd dominated community types. Pinegrass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is midway between the aspen dominated community (1278 kg/ha) and theDouglas fir dominated communities (355 kg/ha). This community would be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	25	-	100
ASPEN *(Populus tremuloides)*	20	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	1	-	100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	-	100
FORBS			
MOUNTAIN DANDELION *(Agoseris glauca)*	5	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	-	100
AMERICAN VETCH *(Vicia americana)*	1	-	100
FIREWEED *(Epilobium angustifolium)*	1	-	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	-	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	28	-	100
HAIRY WILDRYE *(Elymus innovatus)*	17	-	100
ROUGH FESCUE *(Festuca scabrella)*	7	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1646 M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	1268
FORB	98
SHRUB	6
TOTAL	1372

SUGGESTED GRAZING CAPACITY
1.3 HA/AUM

F5: Aw-Sw/Blueberry

(Populus tremuloides-Picea glauca/Vaccinium spp.)

n=2 This community represents the mid successional stage of a Sw/Moss dominated community type. The spruce dominated community types usually occupy lower slope positions with northerly aspects. These sites have escaped the recent fire history in the Montane and have succeeded to white spruce the climax species. There is very little growth of forbs and grass in this community type and should be rated as non-use for domestic livestock.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	36	12-40	100
ASPEN *(Populus tremuloides)*	33	30-35	100
SHRUBS			
TALL BILBERRY *(Vaccinium membranaceum)*	6	0-11	50
SNOWBERRY *(Symphoricarpos occidentalis)*	4	0-8	50
FORBS			
WESTERN MEADOW RUE *(Thalictrum occidentale)*	4	0-6	50
WILD STRAWBERRY *(Fragaria virginiana)*	8	6-10	100
AMERICAN VETCH *(Vicia americana)*	1	0-1	50
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-1	50
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	2	100
GRASSES			
PINE GRASS *(Calamagrostis rubescens)*	3	0-5	50
MELIC GRASS *(Melica smithii)*	12	0-24	50
VIRGINIA WILDRYE *(Elymus virginicus)*	5	0-9	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1524 M

ASPECT: NORTHERLY

SLOPE: 2%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	330
FORB	46
SHRUB	48
TOTAL	424

SUGGESTED GRAZING CAPACITY
NON-USE

F6: Aw-Fd/White meadowsweet

(Populus tremuloides-Pseudotsuga menziesii/Spiraea betulifolia)

n=1 This community type represents an intermediate stage of succession between the Sw-Fd/White meadowsweet and Aw/White meadowsweet/Pinegrass dominated community types. White meadowsweet is indicative of sites with mesic moisture and medium nutrient regimes (Archibald et al. 1996). When this community succeeds to a conifer dominated type there will be insufficient forage for domestic livestock. Presently, with the high aspen cover there will be a moderate forage base and this community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
DOUGLAS FIR *(Pseudotsuga menziesii)*	40	-	100
ASPEN *(Populus tremuloides)*	36	-	100
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	19	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	2	-	100
PRICKLY ROSE *(Rosa acicularis)*	1	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	5	-	100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	2	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
STRAWBERRY *(Fragaria virginiana)*	6	-	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	4	-	100
HAIRY WILD RYE *(Elymus innovatus)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1593 M

ASPECT: SOUTH

SLOPE: 20%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

TOTAL 800 KG/HA*

(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
2.3 HA/AUM

F7: Aw-Pb-Sw/Pinegrass

(Populus tremuloides-Populus balsamifera-Picea glauca/Calamagrostis rubescens)

n=1 This community type occurs on moist, lower slope positions where seepage occurs in the spring or after heavy rainfall. Succession will be to a spruce dominated forest. The high tree cover limits the light reaching the forest floor. Consequently, only a moderate amount of forage is produced for domestic livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST
TREES			
ASPEN			
(Populus tremuloides)	25	-	100
BALSAM POPLAR			
(*Populus balsamifera*)	15	-	100
WHITE SPRUCE			
(*Picea glauca*)	15	-	100
SHRUBS			
ROSE			
(Rosa acicularis)	2	-	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	4	-	100
FORBS			
WILD WHITE GERANIUM			
(Geranium richardsoni)	11	-	100
VEINY MEADOW RUE			
(Thalictrum venulosum)	5	-	100
STRAWBERRY			
(Fragaria virginiana)	7	-	100
TALL LUNGWORT			
(Mertensia paniculata)	5	-	100
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	1	-	100
GRASSES			
PINEGRASS			
(Calamagrostis rubescens)	8	-	100
HAIRY WILDRYE			
(*Elymus innovatus*)	8	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1372 M

ASPECT: WEST

SLOPE: 8%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	122
FORB	282
SHRUB	28
TOTAL	412

SUGGESTED GRAZING CAPACITY
4.4 HA/AUM

F8: Aw-Fa/Snowberry/Pinegrass

(Populus tremuloides-Abies lasiocarpa/Symphoricarpos albus/Calamagrostis rubescens)

n=1 This community is very similar to the Fa-Pl-Sw/White meadowsweet/Pinegrass previously described. This community was described in the Castle area and is indicative of the overlap between the Subalpine and Montane subregions. The overstory has a high cover of subalpine fir a species characteristic of the subalpine environment, but the understory is dominated by snowberry and pinegrass species characteristic of the montane environment. The forage productivity of this community type is moderate, but the majority of production is coming from snowberry which is generally unpalatable to livestock. This community should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST
TREES			
LODGEPOLE PINE *(Pinus contorta)*	6	-	100
ASPEN *(Populus tremuloides)*	48	-	100
SUBALPINE FIR *(Abies lasiocarpa)*	10	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos albus)*	59	-	100
SASKATOON *(Amelanchier alnifolia)*	5	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	-	100
FORBS			
CREEPING MAHONIA *(Berberis repens)*	25	-	100
WESTERN MEADOW RUE *(Thalictrum occidentalis)*	6	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	6	-	100
LINDLEY'S ASTER *(Aster laevis)*	5	-	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	16	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1460M

ASPECT: SOUTH TO SOUTHWEST

SLOPE: 9%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	152
FORB	210
SHRUB	754
TOTAL	1116

SUGGESTED GRAZING CAPACITY
1.6 HA/AUM

F8a: Aw-Pl/Marsh reedgrass

(Populus tremuloides-Pinus contorta/Calamagrostis canadensis)

n=1 This community is very similar to the Aw-Pb/Marsh reedgrass community described which is found in moist lower slope positions throughout the Porcupine Hills. This community type is successional more advanced than the aspen, balsam poplar dominated community type. Continued succession in the absence of disturbance will be to white spruce. The forage productivity of this community type is moderate, but the majority of production is coming from pinegrass which is generally only palatable to livestock early in the spring. This community should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST
TREES			
LODGEPOLE PINE *(Pinus contorta)*	20	-	100
ASPEN *(Populus tremuloides)*	50	-	100
WHITE SPRUCE (*Picea glauca*)	5	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	4	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	13	-	100
FORBS			
CREAM COLORED VETCHLING *(Lathyrus ochroleucus)*	10	-	100
TALL LUNGWORT *(Mertensia paniculata)*	6	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	4	-	100
LINDLEY'S ASTER *(Aster laevis)*	19	-	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	17	-	100
FRINGED BROME (*Bromus cilatus*)	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME :
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE: 1463(1448-1478)M

ASPECT: VARIABLE

SLOPE: 0-1%

SOIL DRAINAGE: WELLTO MOD. WELL

FORAGE PRODUCTION (KG/HA)

GRASS	1140 (938-1342)
TOTAL	1140 (938-1342)

SUGGESTED STOCKING RATE
1.6 HA/AUM

F9: Pl-Aw/Snowberry/Kentucky bluegrass

(Pinus contorta-Populus tremuloides/Symphoricarpos occidentalis/Poa pratensis)

=1 This community type represents an earlier successional stage of the Pl/White meadowsweet and Pl/Pinegrass community types. These communities occupy mesic sites with medium nutrient regimes (Archibald et al. 1996). It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	30	-	100
ASPEN *(Populus tremuloides)*	15	-	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	34	-	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	14	-	100
THIMBLEBERRY *(Rubus parviflora)*	14	-	100
GROUND JUNIPER *(Juniperus communis)*	5	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	12	-	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	8	-	100
SMOOTH ASTER *(Aster laevis)*	6	-	100
DANDELION *(Taraxacum officinale)*	5	-	100
AMERICAN VETCH *(Vicia americana)*	4	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	21	-	100
PINEGRASS *(Calamagrostis rubescens)*	14	-	100
TIMOTHY *(Phleum pratense)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ASPECT: WEST

SLOPE: 26%

FORAGE PRODUCTION (KG/HA)

GRASS	668
FORB	774
SHRUB	506
TOTAL	1948

SUGGESTED GRAZING CAPACITY
0.9 HA/AUM

F10: Aw-Fa-Se/Timothy

(Populus tremuloides-Abies lasiocarpa-Picea engelmannii/Phleum pratense)

n=2 This community was described in the Castle area of the province and if left undisturbed would have likely succeeded to a Fa-Se/Heart lv'd arnica-dominated community type. Heavy grazing pressure has shifted the understory away from native species and allowed dandelion, clover, Canada thistle, timothy and Kentucky bluegrass to establish on the site. This change in species composition with increased grazing pressure is similar to work done by Willoughby (1995). The invasion of non-native species onto this site makes this community very productive for domestic livestock, but the presence of overgrazed communities indicates some type of distribution problem and the management of the disposition should be discussed with the permitees.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	5	0-10	50
SUBALPINE FIR *(Abies lasiocarpa)*	5	0-10	50
ASPEN *(Populus tremuloides)*	84	15-95	100
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis, S. albus)*	12	9-14	100
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	13	5-21	100
DANDELION *(Taraxacum offincinale)*	33	17-49	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	24	1-47	100
SMOOTH ASTER *(Aster laevis)*	11	1-21	100
CANADA THISTLE *(Cirsium arvense)*	5	3-6	100
CLOVER *(Trifolium repens)*	20	0-40	50
GRASSES			
TIMOTHY *(Phleum pratense)*	25	12-36	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	11	0-21	50
MOUNTAIN BROME *(Bromus carinatus)*	7	1-13	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	0-6	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1402(1370-1434)M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	1328(968-1688)
FORB	346(266-426)
SHRUB	232(218-246)
TOTAL	1906(1452-2360)

SUGGESTED GRAZING CAPACITY
0.9 HA/AUM

F11: Spruce-Pb/Snowberry

(Picea glauca, P. engelmannii-Populus balsamifera/Symphoricarpos occidentalis)

n=3 Archibald et al. (1996) described a similar Pb/Snowberry-dominated community on moist lower slope positions where seepage occurs in the spring and after heavy rainfalls. They felt succession would be to white spruce. This community is successionally more advanced than the Pb/Snowberry dominated community type. Likely the northerly aspects of the 3 stands described allowed this community to escape the extensive fire history in the area. The high canopy cover of trees and shrubs limits the amount of light reaching the forest floor and therefore there is only moderate amounts of forage available for domestic livestock. This community type would be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
SUBALPINE FIR *(Abies lasiocarpa)*	4	0-10	33
ENGELMANN SPRUCE *(Picea engelmannii)*	15	0-45	33
BALSAM POPLAR (*Populus balsamifera*)	16	0-15	66
WHITE SPRUCE (*Picea glauca*)	5	0-10	66
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	1	0-1	33
SNOWBERRY *(Symphoricarpos occidentalis S. albus)*	9	0-16	66
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-2	66
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	8	1-15	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	2-9	100
STRAWBERRY *(Fragaria virginiana)*	4	3-5	100
CANADA VIOLET *(Viola canadensis)*	3	1-5	100
DANDELION *(Taraxacum officinale)*	2	1-4	100
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-6	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	7	0-13	66

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO HYGRIC

NUTRIENT REGIME :
MESOTROPHIC TO PERMESOTROPHIC

ELEVATION: 1507(1455-1554)M

ASPECT: NORTHERLY

SLOPE: 2(0-7)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	97(20-252)
FORB	681(232-1018)
SHRUB	237(40-540)
TOTAL	1016(524-1578)

SUGGESTED GRAZING CAPACITY
1.8 HA/AUM

F12: Sw-Aw/Scouring rush

(Picea glauca-Populus tremuloides/Equisetum scirpoides)

n=1 This community occupies moist, nutrient rich, lower slope positions. This community is very similar to the Sw/Horsetail community described by Archibald et al. (1996). Archibald et al. felt that the ecosite representing this community represented the wettest and most nutrient rich conditions for the Montane subregion. They felt balsam poplar was the pioneer species on this ecosite and that succession would be to white spruce. The high tree cover limits the light reaching the forest floor. Consequently, there is little forage available for domestic livestock. This community should be rated as non-use.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	15	-	100
WHITE SPRUCE *(Picea glauca)*	60	-	100
BALSAM POPLAR *(Populus balsamifera)*	10	-	100
SHRUBS			
ROSE *(Rosa acicularis)*	3	-	100
FORBS			
DANDELION *(Taraxacum offincinale)*	4	-	100
DWARF SCOURING RUSH *(Equisetum scirpoides)*	20	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	-	100
AMERICAN VETCH *(Vicia americana)*	1	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	-	100
HAIRY WILD RYE *(Elymus innovatus)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1494 M

SLOPE: 1%

ASPECT: SOUTHEAST

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

TOTAL 800 KG/HA*

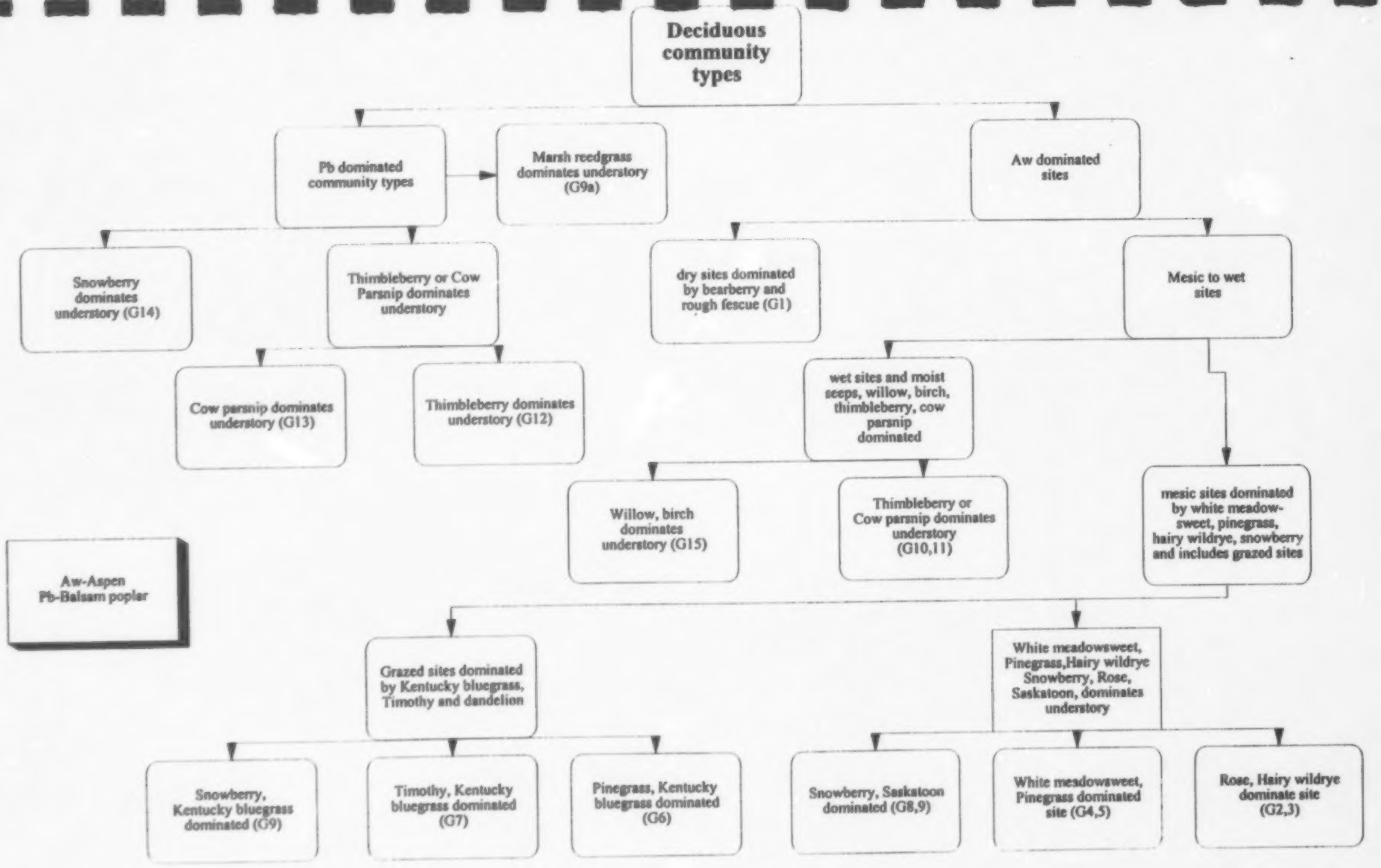
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
NON-USE

MONTANE SUBREGION

DECIDUOUS COMMUNITY TYPES

Photo 10: This Aw/Cow parsnip community type is typical of moist, nutrient-rich seepage areas north of the Crowsnest Pass. South of the pass cow parsnip is often replaced by thimbleberry.


Deciduous community types
Pb dominated community types
Marsh reedgrass dominates understory (G9a)
Aw dominated sites
Snowberry dominates understory (G14)
Thimbleberry or Cow Parsnip dominates understory
dry sites dominated by bearberry and rough fescue (G1)
Mesic to wet sites
Cow parsnip dominates understory (G13)
Thimbleberry dominates understory (G12)
wet sites and moist seeps, willow, birch, thimbleberry, cow parsnip dominated
Willow, birch dominates understory (G15)
Thimbleberry or Cow parsnip dominates understory (G10,11)
mesic sites dominated by white meadow-sweet, pinegrass, hairy wildrye, snowberry and includes grazed sites
Aw-Aspen
Pb-Balsam poplar
Grazed sites dominated by Kentucky bluegrass, Timothy and dandelion
White meadowsweet, Pinegrass,Hairy wildrye Snowberry, Rose, Saskatoon, dominates understory
Snowberry, Kentucky bluegrass dominated (G9)
Timothy, Kentucky bluegrass dominated (G7)
Pinegrass, Kentucky bluegrass dominated (G6)
Snowberry, Saskatoon dominated (G8,9)
White meadowsweet, Pinegrass dominated site (G4,5)
Rose, Hairy wildrye dominate site (G2,3)

Key to Deciduous community types in the Montane subregion

G1: Aw/Bearberry/Rough fescue

(Populus tremuloides/Arctostaphylos uva-ursi/Festuca scabrella)

n=7 This community type occupies dry, upper slope and hilltop positions and represents the invasion of aspen onto a Rough fescue-Sedge/Bearberry-dominated community type. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. In years of drought aspen will likely die back in this community type. Frequent fire also tends to control the spread of aspen onto these rough fescue dominated grasslands. The lack of fire in the last 50 years has allowed many of these grasslands to be invaded by aspen. Invasion of aspen causes a 50% decline in forage productivity and a loss in soil productivity.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	50	30-75	100
SHRUBS			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-6	29
ROSE *(Rosa acicularis)*	4	0-15	78
SNOWBERRY *(Symphoricarpos albus)*	3	0-9	29
FORBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	18	1-37	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	0-14	71
STRAWBERRY *(Fragaria virginiana)*	8	1-19	100
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	5	0-16	71
GRASSES			
ROUGH FESCUE *(Festuca scabrella)*	10	0-15	86
PINEGRASS *(Calamagrostis rubescens)*	22	0-57	86
IDAHO FESCUE *(Festuca idahoensis)*	3	0-12	57
HAIRY WILDRYE *(Elymus innovatus)*	5	0-19	71

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1495(1420-1570) M

SOIL DRAINAGE: WELL

SLOPE: 7(0-15)%

ASPECT: SOUTH

FORAGE PRODUCTION (KG/HA)

GRASS	644(318-1070)
FORB	171(0-462)
SHRUB	132(14-318)
TOTAL	946(436-1528)

SUGGESTEDGRAZING CAPACITY
2.0 HA/AUM

G2: Aw/Rose/Hairy wildrye

(Populus tremuloides/Rosa acicularis/Elymus innovatus)

n=5 This community type occurs on submesic, well drained, south and west-facing slopes. It is situated in slightly lower slope positions and therefore has better developed soils than the limber pine and bearberry-dominated community types previously described. Archibald et al. (1996) described this community type as being part of the Canada buffaloberry-hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. Succession on this site will likely be to the Pl/Buffaloberry/Pinegrass or Fd/Hairy wildrye-dominated community types previously described. This community type has a moderate amount of forage for domestic livestock. It should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	62	36-75	100
SHRUBS			
ROSE			
(Rosa acicularis)	14	4-40	100
SHRUBBY CINQUEFOIL			
(*Potentilla fruticosa*)	1	0-1	40
SNOWBERRY			
(*Symphoricarpos occidentalis*)	2	0-3	60
FORBS			
LINDLEY'S ASTER			
(Aster ciliolatus)	5	1-11	100
WILD STRAWBERRY			
(Fragaria virginiana)	12	3-29	100
DANDELION			
(Taraxacum officinale)	4	1-8	100
YELLOW PEAVINE			
(Lathyrus ochroleucus)	4	1-8	100
FIREWEED			
(*Epilobium angustifolium*)	2	0-8	60
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	25	16-37	100
ROUGH FESCUE			
(Festuca scabrella)	2	0-4	60
PINEGRASS			
(*Calamagrostis rubescens*)	4	0-12	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION :1589 (1350-2270) M

SLOPE: 4(0-10)%

ASPECT: SOUTHERLY

SOIL DRAINAGE: WELL TO RAPIDLY

FORAGE PRODUCTION (KG/HA)

GRASS	856(374-1906)
FORB	313(222-408)
SHRUB	75(0-252)
TOTAL	1244(652-2330)

SUGGESTED GRAZING CAPACITY
1.5 HA/AUM

G3: Aw/Hairy wildrye

(Populus tremuloides/Eiymus innovatus)

n=1 This community type occurs on submesic, well drained, south and west-facing slopes within the Ya Ha Tinda area. It occurs in areas of the grasslands where moisture is sufficient to grow trees. Beckingham et al. (1996) described this community type as being part of the hairy wildrye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the bearberry and grassland ecosites. Succession on this site will likely be to the Pl/Hairy wildrye or Sw/Hairy wildrye-dominated community types previously described. This community type has a high amount of forage because of the increased moisture. In the winter elk often occupy these sites as bedding areas during the day. The southerly and westerly aspect increases solar gains and the trees provide a degree of security.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	35	-	100
SHRUBS			
SHRUBBY CINQUEFOIL (*Potentilla fruticosa*)	1	-	100
FORBS			
AMERICAN VETCH *(Vicia americana)*	6	-	100
WILD STRAWBERRY *(Fragaria virginiana)*	18	-	100
YARROW *(Achillea millefolium)*	5	-	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	-	100
NORTHERN BEDSTRAW (*Galium boreale*)	3	-	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	22	-	100
ROUGH FESCUE *(Festuca scabrella)*	4	-	100
TIMOTHY (*Phleum pratense*)	4	-	100
FRINGED BROME (*Bromus ciliatus*)	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME :
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

ELEVATION:
1700 M

SLOPE:
10%

ASPECT:
SOUTHERLY

SOIL DRAINAGE:
WELL

FORAGE PRODUCTION (KG/HA)

GRASS	836
FORB	1228
TOTAL	2064

SUGGESTED GRAZING CAPACITY(HORSES)
1.3 HA/AUM

G4: Aw/White meadowsweet/Pinegrass

(Populus tremuloides/Spiraea betulifolia/Calamagrostis rubescens)

n=10 This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by white meadowsweet, pinegrass or feather moss depending upon the successional status of the stand. In the vicinity of the Crowsnest Pass creeping mahonia is also common on these sites (Archibald et al. 1996). White meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pinegrass. Because this community type is in an early successional stage it produces a moderate amount of forage for domestic livestock and should be considered secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	49	30-74	100
LODGEPOLE PINE			
(Pinus contorta)	3	0-15	50
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	18	10-29	100
ROSE			
(Rosa acicularis.)	3	0-7	90
DWARF BILBERRY			
(Vaccinium caespitosum)	3	0-14	30
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	1	0-2	30
CANADA BUFFALOBERRY			
(Shepherdia canadensis)	T	0-2	30
FORBS			
SHOWY ASTER			
(Aster conspicuus)	7	1-15	100
STRAWBERRY			
(Fragaria virginiana)	6	1-15	100
NORTHERN BEDSTRAW			
(Galium boreale)	2	1-3	100
YELLOW PEAVINE			
(Lathyrus ochroleucus)	5	0-9	90
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	4	0-15	60
SEDGE			
(Carex spp.)	1	0-5	30
PINEGRASS			
(Calamagrostis rubescens)	20	8-40	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE (MEAN): 1543(1460-1676) M

ASPECT: SOUTH TO WEST

SLOPE: 9(0-25)%

SOIL DRAINAGE: WELL TO MOD. WELL

FORAGE PRODUCTION (KG/HA)

GRASS	425(332-518)
FORB	531(444-618)
SHRUB	190(164-216)
TOTAL	1146(992-1300)

SUGGESTED GRAZING CAPACITY
1.6 HA/AUM

G5: Aw/Rose/Pinegrass

(Populus tremuloides/Rosa acicularis/Calamagrostis rubescens)

n=34 This community, dominated by a aspen overstory and an understory of pinegrass, and represents an earlier successional stage of the Pl/Pinegrass community type. This community is also very similar to the previously described Aw/White meadowsweet/Pinegrass community type, but the high cover of pinegrass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pinegrass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source. The forage productivity of this community type is moderate. As a result, this community should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	2	0-35	14
ASPEN *(Populus tremuloides)*	47	3-70	100
SHRUBS			
ROSE *(Rosa acicularis)*	8	0-22	85
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-12	35
SASKATOON (*Amelanchier alnifolia*)	1	0-2	53
FORBS			
YELLOW PEAVINE *(Lathyrus ochroleucus)*	5	0-11	91
NORTHERN BEDSTRAW (*Galium boreale*)	2	0-4	97
STRAWBERRY (*Fragaria virginiana*)	9	0-20	97
AMERICAN VETCH (*Vicia americana*)	4	0-8	91
LINDLEY'S ASTER (*Aster ciliolatus*)	7	0-25	82
SHOWY ASTER (*Aster conspicuus*)	5	0-31	67
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	18	0-51	94
HAIRY WILDRYE *(Elymus innovatus)*	6	0-23	82

ENVIRONMENTAL VARIABLES

MOISTURE REGIME : SUBMESIC TO MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE: 1524(1360-1646)

ASPECT: VARIABLE

SOIL DRAINAGE: WELL

FORAGE PRODUCTION(KG/HA)

GRASS	804(0-3318)
FORB	502(0-1584)
SHRUB	47(0-378)
TOTAL	1338(538-2204)

SUGGESTED GRAZING CAPACITY
1.4 HA/AUM

F3

G6: Aw/Pinegrass-Kentucky bluegrass

(Populus tremuloides/Calamagrostis rubescens-Poa pratensis)

n=4 This community type is very similar to the previously described Aw/Rose/Pinegrass community, but has been grazed by livestock. It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	29	15-40	100
SHRUBS			
WILD RED RASPBERRY *(Rubus idaeus)*	7	1-9	100
ROSE (*Rosa acicularis*)	7	1-14	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	1-10	100
SMOOTH ASTER *(Aster laevis)*	3	0-7	50
DANDELION *(Taraxacum officinale)*	7	2-11	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	8	1-19	100
YELLOW PEAVINE (*Lathyrus ochroleucus*)	4	1-7	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	13	2-28	100
HAIRY WILDRYE *(Elymus innovatus)*	2	0-5	75
KENTUCKY BLUEGRASS (*Poa pratensis*)	15	1-27	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1463(1432-1493) M

ASPECT: SOUTHERLY

SLOPE: 13(5-20)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION(KG/HA)

GRASS	1005(0-2402)
FORB	582(194-884)
SHRUB	126(0-236)
TOTAL	1713(770-3286)

SUGGESTED GRAZING CAPACITY
1.1 HA/AUM

G7: Aw/Timothy-Kentucky bluegrass

(Populus tremuloides/Phleum pratense-Poa pratensis)

n=4 This community is similar to the Aw/Rose/Pinegrass community, but heavy grazing pressure has shifted the understory away from native species and allowed dandelion, clover, timothy and Kentucky bluegrass to establish on the site. This change in species composition with increased grazing pressure is similar to work done by Willoughby (1995). The invasion of non-native species onto this site makes this community very productive for domestic livestock, but the presence of overgrazed communities indicates some type of distribution problem and the management of the disposition should be discussed with the permittees.

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	64	40-80	100
SHRUBS			
WILD RED RASPBERRY *(Rubus idaeus)*	3	0-10	50
SNOWBERRY *(Symphoricarpos occidentalis)*	4	0-9	75
FORBS			
DANDELION *(Taraxacum officinale)*	13	1-39	100
WILD BERGAMONT *(Monarda fistulosa)*	3	0-11	50
STRAWBERRY *(Fragaria virginiana)*	1	1-2	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	3	0-11	25
CLOVER *(Trifolium hybridum)*	1	0-4	25
GRASSES			
TIMOTHY *(Phleum pratense)*	25	10-41	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	0-26	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1400(1250-1536)M

ASPECT: SOUTHERLY

SLOPE: 8(0-20)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	1006(794-1242)
FORB	114(0-176)
SHRUB	242(0-854)
TOTAL	1362(1034-1824)

SUGGESTED GRAZING CAPACITY
1.3 HA/AUM

G8: Aw/Snowberry-Saskatoon

(Populus tremuloides/Symphoricarpos occidentalis(S.albus)-Amelanchier alnifolia)

n=9 This community is one of several community types which represent the mesic/rich ecosite for the Montane subregion (Archibald et al. 1996). These sites can be dominated by white spruce, aspen or lodgepole pine. The understory can be dominated by thimbleberry, snowberry, saskatoon or pinegrass. Succession of this community type will likely be to white spruce. The Aw/Thimbleberry dominated community type is probably moister and slightly richer than this community type. Forage production on the aspen phase of this ecosite can be quite high averaging 1278 kg/ha. This makes these community types moderately productive for domestic livestock and should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	65	45-99	100
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	15	0-28	89
SNOWBERRY *(Symphoricarpos occidentalis, S. albus)*	38	2-97	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	0-19	44
ROSE (*Rosa acicularis*)	3	0-9	11
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	1-15	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-19	67
YELLOW PEAVINE *(Lathyrus ochroleucus)*	4	0-8	89
SHOWY ASTER *(Aster conspicuus)*	2	0-10	44
CANADA VIOLET (*Viola canadensis*)	4	0-13	56
COW PARSNIP (*Heracleum lanatum*)	3	0-10	33
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	2	0-6	56
PINEGRASS *(Calamagrostis rubescens)*	3	0-14	78

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

ELEVATION RANGE : 1504(1370-1680) M

ASPECT: SOUTH TO EAST

SLOPE: 14(0-35)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	653(42-1538)
FORB	406(300-1014)
SHRUB	335(10-1022)
TOTAL	1278(520-1708)

SUGGESTED GRAZING CAPACITY
1.4 HA/AUM

G9: Aw/Snowberry/Kentucky bluegrass

(Populus tremuloides/Symphoricarpos albus/Poa pratensis)

n=2 This community type is very similar to the previously described Aw/Snowberry-Saskatoon community, but has been grazed by livestock. It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	64	50-78	100
WHITE SPRUCE *(Picea glauca)*	3	2-3	100
SHRUBS			
ROSE *(Rosa acicularis)*	6	3-7	100
RED TWINBERRY *(Lonicera utahensis)*	2	0-4	50
SASKATOON *(Amelanchier alnifolia)*	1	0-2	50
SNOWBERRY *(Symphoricarpos albus)*	21	16-24	100
FORBS			
CREEPING MAHONIA *(Berberis repens)*	12	7-17	100
DANDELION *(Taraxacum officinale)*	7	1-12	100
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	1-3	100
STRAWBERRY *(Fragaria virginiana)*	2	1-2	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	4	0-7	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	24	17-34	100
MOUNTAIN BROME *(Bromus carinatus)*	8	0-16	50
ONION GRASS *(Melica spectabilis)*	5	0-9	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL TO RAPIDLY

ELEVATION: 1414(1372-1457)M

ASPECT: SOUTHERLY

SLOPE: 3(2-4)%

FORAGE PRODUCTION(KG/HA)

GRASS	606(516-696)
FORB	749(734-764)
SHRUB	354(0-708))
TOTAL	1709(1460-1958)

SUGGESTED GRAZING CAPACITY
1.1 HA/AUM

G9a: Aw-Pb/Marsh reedgrass

(Populus tremuloides-P.balsamifera/Calamagrostis canadensis)

n=8 This community type was described on lower slope positions where some nutrient rich seepage occurs during the growing season. It is generally found north of the Porcupine Hills in areas that have north and easterly aspects. Marsh reedgrass is not common in the Montane subregion and the presence of this grass species may indicate that the climate is closer to the Lower Foothills or Subalpine subregion. This community type has a low shrub cover and extensive cover of grass which makes it fairly attractive to livestock. Often these community types are heavily utilized.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	43	20-60	100
BALSAM POPLAR			
(*Populus balsamifera*)	9	0-25	38
SHRUBS			
ROSE			
(Rosa acicularis)	1	0-2	63
SASKATOON			
(Amelanchier alnifolia)	2	0-15	13
FORBS			
FIREWEED			
(Epilobium angustifolium)	7	1-14	100
DANDELION			
(Taraxacum officinale)	5	1-9	100
YELLOW PEAVINE			
(*Lathyrus ochroleucus*)	4	0-10	63
STRAWBERRY			
(*Fragaria virginiana*)	4	1-8	100
VEINY MEADOW RUE			
(*Thalictrum venulosum*)	6	0-18	63
WILD WHITE GERANIUM			
(*Geranium richardsonii*)	12	0-27	88
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	3	0-16	63
MARSH REEDGRASS			
(Calamagrostis canadensis)	20	10-38	100
FRINGED BROME			
(*Bromus cilatus*)	3	0-7	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1494(1417-1570)M

ASPECT: NORTHERLY, EASTERLY

SLOPE: 4(0-10)%

FORAGE PRODUCTION(KG/HA)

GRASS	1042(0-2568)
FORB	404(186-498)
SHRUB	39(0-144)
TOTAL	1485(960-2568)

SUGGESTED GRAZING CAPACITY
1.2 HA/AUM

G10: Aw/Thimbleberry

(Populus tremuloides/Rubus parviflorus)

n=7 Nutrient rich seepage occurs at some point in the growing season in this community type favouring the growth of thimbleberry. On these sites thimbleberry is very common south of the Crowsnest Pass and is generally replaced by cow parsnip north of the Pass. Succession on these sites will be from aspen to pine and then to white spruce. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Thimbleberry is generally unpalatable to livestock, but if the site has an abundance of cow parsnip it may be extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	1	0-5	14
ASPEN			
(Populus tremuloides)	69	30-90	100
BALSAM POPLAR			
(Populus balsamifera)	3	0-21	14
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	4	0-12	57
THIMBLEBERRY			
(Rubus parviflorus)	36	11-66	100
SNOWBERRY			
(Symphoricarpos occidentalis)	7	0-15	71
SASKATOON			
(Amelanchier alnifolia)	7	0-33	57
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	4	1-11	100
SHOWY ASTER			
(Aster conspicuus)	3	0-11	71
COW PARSNIP			
(Heracleum lanatum)	4	0-24	29
VEINY MEADOW RUE			
(Thalictrum venulosum)	6	0-13	86
NORTHERN BEDSTRAW			
(Galium boreale)	1	0-3	71
WILD WHITE GERANIUM			
(Geranium richardsonii)	4	0-10	86
GRASSES			
HAIRY WILDRYE			
(Elymus innovatus)	1	0-3	29
PINE GRASS			
(Calamagrostis rubescens)	3	0-15	29
KENTUCKY BLUEGRASS			
(Poa pratensis)	2	0-15	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO MESIC

NUTRIENT REGIME : PERMESOTROPHIC

ELEVATION: 1645(1562-1707)M

ASPECT: SOUTHERLY

SLOPE:15(8-20)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION (KG/HA)

GRASS	637(232-1194)
FORB	404(300-498)
SHRUB	381(172-584)
TOTAL	1422(1108-1878)

SUGGESTED GRAZING CAPACITY
1.3HA/AUM

G11: Aw/Cow parsnip

(Populus tremuloides/Heracleum lanatum)

n=5 Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip. This community type is very similar to the Aw/Thimbleberry community, but is more common north of the Crowsnest Pass. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and maybe extensively utilized. This community type should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	51	25-75	100
SHRUBS			
ROSE *(Rosa acicularis)*	3	0-6	80
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6	0-15	80
FORBS			
COW PARSNIP *(Heracleum lanatum)*	40	25-65	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	6	2-13	100
SHOWY ASTER *(Aster conspicuus)*	7	2-12	100
STRAWBERRY *(Fragaria virginiana)*	4	1-6	100
FIREWEED *(Epilobium angustifolium)*	10	1-32	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	8	9-19	60
FRINGED BROME *(Bromus ciliatus)*	5	0-7	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO MESIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1511(1402-1615)M

ASPECT: SOUTHERLY

SLOPE: 15(0-20)%

SOIL DRAINAGE: MOD. WELL

FORAGE PRODUCTION(KG/HA)

GRASS	525(400-812)
FORB	2569(860-6278)
SHRUB	74(0-198)
TOTAL	3169(1458-6688)

SUGGESTED GRAZING CAPACITY
0.6 HA/AUM

G12: Pb/Thimbleberry
(Populus balsamifera/Rubus parviflorus)

n=1 This community type was described in the Southend allotment just north of Waterton Lakes National Park at a higher subalpine elevation. It was found in a moist, nutrient rich, lower slope position, which favours the growth of both balsam poplar and thimbleberry. It is very similar to the Aw/Thimbleberry community previously described, but the higher elevation is out of the range of growth conditions for aspen. As a result, balsam poplar dominates the site.

PLANT COMPOSITION

Plant Composition	Canopy Cover (%) Mean	Range	Const.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	85	-	100
ASPEN *(Populus tremuloides)*	3	-	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	58	-	100
WILLOW *(Salix spp.)*	30	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	7	-	100
FORBS			
JESSICA'S STICKSEED *(Hackelia jessicae)*	10	-	100
SMOOTH SWEET CICELY *(Osmorhiza chilensis)*	8	-	100
CANADA VIOLET *(Viola canadensis)*	8	-	100
BANEBERRY *(Actaea rubra)*	6	-	100
GREEN FALSE HELLEBORE *(Veratrum eschscholtzii)*	2	-	100
GRASSES			
ALASKA ONION GRASS *(Melica subulata)*	2	-	100
NODDING TRISETUM *(Trisetum cernuum)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1707 M

SLOPE: 4%

ASPECT: SOUTHEAST

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION (KG/HA)

GRASS	36
FORB	1234
SHRUB	684
TOTAL	1954

SUGGESTED GRAZING CAPACITY
0.9 HA/AUM

G13: Pb/Cow parsnip/Kentucky bluegrass
(Populus balsamifera/Heracleum lanatum/Poa pratensis)

n=1 This community type occupies subhygric, lower slope positions. It is similar to the Pb/Thimbleberry community type previously described, but lacks the cover of thimbleberry. Generally, thimbleberry is replaced by cow parsnip north of the Crowsnest Pass. The high moisture and nutrient content of this site make it highly productive. Domestic livestock find cow parsnip palatable. This community should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	75	-	100
SHRUBS			
STICKY CURRANT *(Ribes viscosissimum)*	9	-	100
ROSE (*Rosa acicularis*)	5	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	26	-	100
CANADA VIOLET *(Viola canadensis)*	25	-	100
SWEET CICELY *(Osmorhiza chiiensis)*	11	-	100
COW PARSNIP *(Heracleum lanatum)*	8	-	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	6	-	100
GRASSES			
SEDGE *(Carex spp.)*	11	-	100
KENTUCKY BLUEGRASS (*Poa pratensis*)	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1424 M

SLOPE: 3 %

ASPECT: SOUTHWEST

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION(KG/HA)

GRASS	4
FORB	856
SHRUB	1010
TOTAL	1870 *ESTIMATE

SUGGESTED GRAZING CAPACITY
1.0 HA/AUM

G15: Aw/Birch-Willow

(Populus tremuloides/Betula occidentalis-Salix glauca)

n=1 This community was described adjacent to a pond in the Southend allotment just north of Waterton Lakes National Park. Both water birch and smooth willow are well adapted to growing adjacent to streams and ponds. What is unusual about this community is the high aspen and pinegrass cover. Aspen and pinegrass are usually associated with more mesic sites. The high cover of willow, water birch and aspen limit the light reaching the forest floor. Therefore there is only moderate production for domestic livestock. This community should be rated as non-use.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	90	-	100
WHITE SPRUCE *(Picea glauca)*	4	-	100
SHRUBS			
WATER BIRCH *(Betula occidentalis)*	21	-	100
SMOOTH WILLOW *(Salix glauca)*	21	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	15	-	100
BUFFALOBERRY *(Shepherdia canadensis)*	15	-	100
FORBS			
SHOWY ASTER *(Aster conspicuus)*	10	-	100
STRAWBERRY *(Fragaria virginiana)*	8	-	100
WINTERGREEN *(Pyrola asarifolia)*	7	-	100
SMOOTH ASTER *(Aster laevis)*	7	-	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	4	-	100
GRASS			
PINEGRASS *(Calamagrostis rubescens)*	15	-	100
ALASKA ONION GRASS *(Melica subulata)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION: 1600M

SOIL DRAINAGE: MODERATELY WELL TO POORLY

FORAGE PRODUCTION(KG/HA)

GRASS	804
FORB	452
SHRUB	622
TOTAL	1878

SUGGESTED GRAZING CAPACITY
NON-USE

MONTANE CUTBLOCKS

In order to classify the cutblocks of the Montane subregion properly and understand the successional sequences which occur after harvesting the preharvest community type and year the stand was harvested must be determined. This information was not available for this classification and therefore it was difficult to determine the successional pathways. For example many cutblocks in the Castle area and Porcupine Hills are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other disturbance factor is influencing tree regeneration. Heavy grazing and competition from grass species can influence tree regeneration, heavy grazing pressure was described on a number of cutblocks in the Castle area. These cutblocks had been grazed so heavily that the agronomic species (Kentucky bluegrass, timothy and clover) dominated the sites and a number of sites had been seeded with creeping red fescue which can compete with tree seedlings for moisture and nutrients.

Cutblocks can be an important source of forage for domestic livestock. They produce on average twice as much as deciduous stands and nearly three times more than conifer stands. This production varies from area to area in the Montane. Generally the production averages 1800 to 1900 kg/ha in the Castle and Porcupine Hills and drops dramatically in the Gap area to 700 kg/ha. It must be remembered that this increase in forage is only temporary. As the cutblock undergoes succession there will be a corresponding drop in forage production. Increases in carrying capacity after harvesting can be acquired through a temporary permit.

In order to understand the forage productivity on cutblocks between different areas of the Montane the cutblocks were split into the Gap, Castle and Porcupine Hills. It must be remembered that maximum forage productivity does not occur on a cutblock until it is approximately 3 years old. One year old cutblocks will generally have less than half the total production of a 3 year old block.

Table 5. Cutblock community types in the Montane subregion.

Community number	Community type	Productivity (kg/ha) Grass	Forb	Shrub	Total	Moisture	Drainage	Carrying Capacity (ha/AUM)
	Cutblocks in Gap area							
H1	Pine blocks	307	416	15	739	Mesic	Well	2.5
H2	Pine-Spruce blocks	112	580		692	Mesic	Well	2.6
	Cutblocks in Castle area							
H3	Kentucky bluegrass-Timothy	1208	789	184	2181	Mesic	Well	0.9
H4	Creeping red fescue	503	704	457	1663	Mesic	Well	1.1
H5	Beaked sedge	3994	16	0	4010	Hygric	Poorly	0.5
H6	Subalpine fir	550	1106	190	1846	Mesic	Well	1.0
H7	Pine-Spruce/Pinegrass	831	973	116	1953	Mesic	Well	1.0
	Cutblocks in Porcupine Hills							
H8	Pine blocks	1392	370	152	1647	Mesic	Well	1.1

H1: Pine blocks (Gap)

(Pinus contorta)

n=24 These cutblocks were described in the Gap allotment just north of Crowsnest Mountain. These blocks are probably more representative of the Subalpine subregion than the Montane.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONTS.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	6	0-20	75
WHITE SPRUCE *(Picea glauca)*	3	0-14	46
SHRUBS			
BRISTLY BLACK CURRANT *(Ribes lacustre)*	5	0-14	46
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	0-33	100
STRAWBERRY *(Fragaria virginiana)*	12	0-30	96
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4	0-10	88
DANDELION *(Taraxacum officinale)*	2	0-6	75
SMOOTH ASTER *(Aster laevis)*	5	0-16	58
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	7	0-31	83
SEDGE SPP. *(Carex spp.)*	5	0-21	58
HAIRY WILDRYE *(Elymus innovatus)*	3	0-22	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: Mesic

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1767(1585-1890) M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	307(0-962)
FORB	416(140-586)
SHRUB	15(0-84)
TOTAL	739(408-1102)

SUGGESTED GRAZING CAPACITY
2.5 HA/AUM

H2: Pine-Spruce blocks (Gap)

(Pinus contorta-Picea glauca)

n=6

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	15	1-40	100
LODGEPOLE PINE (*Pinus contorta*)	12	0-40	89
SHRUBS			
WILLOW SPP. *(Salix spp.)*	4	0-11	83
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	28	10-43	100
WILD STRAWBERRY *(Fragaria virginiana)*	28	18-41	100
FIREWEED *(Epilobium angustifolium)*	7	3-12	100
DANDELION *(Taraxacum officinale)*	3	1-4	100
FIELD HORSETAIL (*Equisetum arvense*)	5	0-14	83
GRASSES			
SEDGE SPP. *(Carex spp.)*	22	12-34	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	5	0-10	50
PINEGRASS (*Calamagrostis rubescens*)	2	0-11	17

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1752(1707-1829) M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	112(0-276)
FORB	580(0-950)
TOTAL	692(276-954)

SUGGESTED GRAZING CAPACITY
2.6 HA/AUM

H3: Kentucky bluegrass-Timothy (Castle)

(Poa pratensis-Phleum pratense)

n=12 This community type represents cutblocks that have been heavily grazed by livestock. Heavy livestock grazing favours the growth of invaders Kentucky bluegrass and timothy. The grazing pressure which favours the growth of these grass species is usually detrimental to the growth of trees. Cattle damage to the conifer trees is usually trampling damage which scars the trees and breaks the stem.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	T	0-2	8
LODGEPOLE PINE *(Pinus contorta)*	1	0-8	33
ASPEN *(Populus tremuloides)*	8	0-90	8
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	0-10	42
SASKATOON *(Amelanchier alnifolia)*	1	0-4	33
FORBS			
FIREWEED *(Epilobium angustifolium)*	4	0-23	92
STRAWBERRY *(Fragaria virginiana)*	11	0-26	92
ASTER SPP. *(Aster spp.)*	4	0-10	33
YARROW *(Achillea millefolium)*	9	1-32	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	31	11-91	100
SEDGE *(Carex spp.)*	9	0-47	33
PINEGRASS *(Calamagrostis rubescens)*	7	0-30	67
TIMOTHY *(Phleum pratense)*	7	0-45	58

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE :1491(1372-1707) M

ASPECT: VARIABLE

SLOPE: 9(0-32)%

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	1208(20-1578)
FORB	789(118-1220)
SHRUB	184(0-540)
TOTAL	2181(1578-2686)

SUGGESTED GRAZING CAPACITY
0.9 HA/AUM

H4: Creeping red fescue (Castle)
(Festuca rubra)

n=7 This community type represents cutblocks that have been heavily grazed and seeded with creeping red fescue. Creeping red fescue a rhizomatous grass can quickly form a sod on the top of the soil, which makes it difficult to grow trees. These seeded cutblocks can be very productive for domestic livestock, but it will be very difficult to regenerate trees on these sites.

PLANT COMPOSITION CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	1	0-9	14
SHRUBS			
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-13	28
GREEN ALDER *(Alnus crispa)*	8	0-54	43
FORBS			
STRAWBERRY *(Fragaria virginiana)*	3	0-14	57
SHOWY ASTER *(Aster conspicuus)*	1	0-7	29
LINDLEY'S ASTER *(Aster ciliolatus)*	2	0-4	14
CLOVER *(Trifolium repens)*	17	0-69	57
FIREWEED *(Epilobium angustifolium)*	3	0-12	57
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-8	43
TIMOTHY *(Phleum pratense)*	3	0-15	57
CREEPING RED FESCUE *(Festuca rubra)*	41	15-87	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION RANGE: 1560(1433-1829))M

SOIL DRAINAGE: WELL

FORAGE PRODUCTION KG/HA

GRASS	503(324-770)
FORB	704(0-2036)
SHRUB	457(0-892)
TOTAL	1663(770-2664)

SUGGESTED GRAZING CAPACITY
1.1 HA/AUM

H5: Beaked sedge(Castle)

(Carex rostrata)

n=1 This community was described in a moist, poorly drained spot within a Pine-Spruce cutblock. It is more representative of a wet sedge meadow. It is likely this community type will never grow trees because of the wet moisture conditions. These sites can be very productive for domestic livestock. When situated within a cutblock the livestock will utilize the drier edges of this community type extensively. This community type may also represent the only water to be found within a cutblock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
FORBS			
NORTHERN WILLOWHERB *(Epilobium ciliatum)*	4	-	100
SWAMP HORSETAIL *(Equisetum fluviatile)*	1	-	100
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	93	-	100
NARROW REEDGRASS *(Calamagrostis stricta)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

ELEVATION RANGE: 1430M

SOIL DRAINAGE: POORLY

FORAGE PRODUCTION KG/HA

GRASS	3994
FORB	16
TOTAL	4010

SUGGESTED GRAZING CAPACITY
0.5 HA/AUM

H6: Subalpine fir blocks (Castle)

(Abies lasiocarpa)

n=9 These cutblocks represent higher elevation sites within the Castle area. Subalpine fir is usually indicative of the Subalpine subregion (Archibald et al. 1996).

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	3	0-15	55
WHITE SPRUCE *(Picea glauca)*	6	0-15	55
SUBALPINE FIR (*Abies lasiocarpa*)	24	15-60	100
SHRUBS			
THIMBLEBERRY *(Rubus parviflorus)*	17	0-54	78
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-2	44
FALSE AZALEA *(Menziesia ferruginea)*	10	0-58	44
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	10	0-20	78
SHOWY ASTER *(Aster conspicuus)*	3	0-9	67
WESTERN MEADOW RUE *(Thalictrum occidentalis)*	4	0-14	67
FIREWEED *(Epilobium angustifolium)*	9	1-29	100
GRASSES			
PINEGRASS *(Calamagrostis rubescens)*	4	0-17	44
SEDGE SPP. *(Carex spp.)*	4	0-16	56
KENTUCKY BLUEGRASS (*Poa pratensis*)	2	0-8	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

ELEVATION: 1652(1494-1798)M

ASPECT: VARIABLE

SLOPE: 21(8-37)%

SOIL DRAINAGE: MODERATELY WELL

FORAGE PRODUCTION KG/HA

GRASS	550(32-1030)
FORB	1106(470-1802)
SHRUB	190(0-650)
TOTAL	1846(1222-2484)

SUGGESTED GRAZING CAPACITY
1.0 HA/AUM

H7: Pine-Spruce/Pinegrass (Castle)

(Pinus contorta-Picea glauca/Calamagrostis rubescens)

n=52 This community type is typical of undisturbed cutblocks in the Castle area of the province. Many of these cutblocks are not regenerating trees. It is not clear if these sites are not regenerating trees because they were historically grasslands or if some other factor is influencing tree regeneration.

Plant Composition — Canopy Cover (%)

	Mean	Range	Const.
Trees			
Lodgepole pine (*Pinus contorta*)	10	0-30	90
White spruce (*Picea glauca*)	5	0-40	59
Shrubs			
White meadowsweet (*Spiraea betulifolia*)	3	0-10	62
Thimbleberry (*Rubus parviflorus*)	3	0-21	39
Snowberry (*Symphoricarpos occidentalis*)	3	0-25	63
Forbs			
Strawberry *(Fragaria virginiana)*	11	0-28	89
Fireweed (*Epilobium angustifolium*)	4	0-18	85
American vetch (*Vicia americana*)	2	0-4	71
Yellow peavine (*Lathyrus ochroleucus*)	2	0-6	67
Showy aster (*Aster conspicuus*)	3	0-5	58
Grasses			
Pinegrass *(Calamagrostis rubescens)*	15	0-42	64
Kentucky bluegrass (*Poa pratensis*)	4	0-6	71
Sedge spp. (*Carex spp.*)	5	0-28	46
Timothy (*Phleum pratense*)	2	0-13	46

Environmental Variables

Moisture regime: Mesic

Nutrient regime: mesotrophic

Elevation: 1529(1432-1800)m

Aspect: Variable

Slope: 13(0-33)%

Soil drainage: Well

Forage Production Kg/ha

Grass	831(42-2698)
Forb	973(104-1732)
Shrub	116(0-588)
Total	1953(378-3582)

Suggested Grazing Capacity
1.0 ha/AUM

H8: Pine blocks (Porcupine hills)

(Pinus contorta)

n=6 This community type is typical of undisturbed cutblocks in the Porcupine Hills. Many of these cutblocks are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other factor is influencing tree regeneration.

Plant Composition

	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Lodgepole pine *(Pinus contorta)*	T	0-1	20
Aspen *(Populus tremuloides)*	1	0-3	33
Shrubs			
Rose *(Rosa acicularis)*	3	0-6	83
Raspberry *(Rubus idaeus)*	4	0-14	50
White meadowsweet *(Spiraea betulifolia)*	3	0-5	83
Thimbleberry (*Rubus parviflorus*)	3	0-7	50
Forbs			
Strawberry *(Fragaria virginiana)*	3	0-7	83
Heart-leaved arnica *(Arnica cordifolia)*	5	0-10	83
Showy aster *(Aster conspicuus)*	5	0-8	83
Bunchberry (*Cornus canadensis*)	6	0-14	100
Grasses			
Hairy wild rye *(Elymus innovatus)*	10	0-31	83
Pinegrass *(Calamagrostis rubescens)*	14	0-32	83

Envrionmental Variables

Moisture regime: Mesic

Nutrient regime: Mesotrophic

Elevation range: 1561(1494-1676) m

Aspect: South to Southwest

Slope: 13(0-20)%

Soil drainage: Well

Forage Production kg/ha

Grass	1209(606-2778)
Forb	311(20-606)
Shrub	126(0-422)
Total	1647(312-3452)

Suggested Grazing Capacity
1.1 ha/AUM

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